

حمل الآن

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المراجعة رقم (1)

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Unit 1**Q1 Choose the correct answer :-**

- 1) If $x, 3, 4, 6$ are proportional, what is the value of x ?
a) 0 b) 1 c) 2 d) 3
- 2) What is the second proportional for the numbers $4, 6, 12$?
a) 18 b) 8 c) 6 d) 2
- 3) If $7x = 3y$, what is the value of $\frac{y}{x}$?
a) $\frac{7}{3}$ b) $\frac{3}{10}$ c) $\frac{10}{3}$ d) $\frac{3}{7}$
- 4) If $2x = 7y$, what is the value of $\left(\frac{x}{y}\right)^{-1}$?
a) $\frac{2}{7}$ b) $\frac{7}{2}$ c) $\frac{49}{4}$ d) $\frac{4}{49}$
- 5) If $5x - 3y = 0$, what is the value of $\frac{x}{y}$?
a) $\frac{5}{3}$ b) $\frac{3}{5}$ c) $-\frac{3}{5}$ d) $-\frac{5}{3}$
- 6) If $5a, 2, 3b, 7$ are four proportional quantities. What is the value of: $\frac{a}{b}$?
a) $\frac{3}{7}$ b) $\frac{6}{35}$ c) $\frac{3}{5}$ d) $\frac{3}{2}$
- 7) If $\frac{a}{5} = \frac{b}{3}$, what is the value of: $\frac{a+b}{a-b}$?
a) $\frac{8}{3}$ b) $\frac{5}{3}$ c) $\frac{1}{4}$ d) 4
- 8) If $\frac{a}{3} = \frac{b}{4}$, what is the value of: $\frac{3a-b}{b-a}$?
a) $\frac{4}{3}$ b) $\frac{3}{4}$ c) $\frac{1}{5}$ d) 5
- 9) If $\frac{a}{3} = \frac{b}{2}$, what is the value of $(6a - 9b - 1)^{2026}$?
a) 2026 b) -2026 c) 1 d) -1
- 10) If $\frac{a}{3} = \frac{b}{5}$, $5a - 2b = 20$, what is the value of: b ?
a) 3 b) 5 c) 15 d) 20



- 11) If $\frac{3a}{5b} = \frac{1}{2}$, what is the value of: $\frac{a}{b}$?
a) $\frac{6}{5}$ b) $\frac{5}{6}$ c) $\frac{2}{3}$ d) $\frac{3}{2}$
- 12) If $4x^2 = 9y^2$, what is the value of: $\frac{x}{y}$?
a) $\frac{9}{4}$ b) $\frac{3}{2}$ c) $\pm \frac{2}{3}$ d) $\pm \frac{3}{2}$
- 13) If $\frac{5a-7b}{2a+3b} = 0$, what is the value of: $\frac{b}{a}$?
a) $\frac{5}{7}$ b) $\frac{7}{5}$ c) $\frac{3}{10}$ d) $\frac{10}{3}$
- 14) If $\frac{a+2b}{a-b} = \frac{2}{3}$, what is the value of: $\frac{b}{a}$?
a) $\frac{1}{8}$ b) 8 c) $-\frac{1}{8}$ d) -8
- 15) If $4x^2 + 9y^2 = 12xy$, what is the value of: $\frac{x}{y}$?
a) $\frac{3}{2}$ b) $\frac{2}{3}$ c) $-\frac{2}{3}$ d) $-\frac{3}{2}$
- 16) If $3a = 6$ $b = 8c$, then $a : b : c$ equals
a) 3 : 4 : 8 b) 3 : 6 : 8 c) 8 : 4 : 3 d) 8 : 6 : 3
- 17) If $\frac{x}{6} = \frac{y}{10}$, what is the value of $\frac{x}{y}$?
a) $\frac{5}{3}$ b) $\frac{5}{6}$ c) $\frac{3}{5}$ d) $\frac{5}{10}$
- 18) If $a, b, 2, 3$ are proportional, what is the value $\frac{b}{a}$?
a) $\frac{3}{2}$ b) $\frac{2}{3}$ c) 3 d) 2
- 19) If $\frac{a}{b} = \frac{2}{7}$, what is the value of $\frac{2b}{7a}$?
a) $\frac{4}{49}$ b) $\frac{2}{7}$ c) 1 d) $\frac{49}{4}$
- 20) If $a, x, b, 2x$ are proportional, what is the value $\frac{a}{b}$?
a) 2 b) $\frac{1}{2}$ c) $\frac{1}{3}$ d) $\frac{1}{4}$

21) If a, b, c, d are proportional quantities, then:

- a) $\frac{b}{d} = \frac{a}{c}$ b) $\frac{a}{c} = \frac{d}{b}$ c) $\frac{b}{c} = \frac{a}{d}$ d) $ab = cd$

22) If $\frac{5}{x} = \frac{6}{y}$, what is the value of $\frac{2x+y}{y-x}$?

- a) 5 b) $\frac{11}{16}$ c) $\frac{16}{11}$ d) 16

23) If $\frac{a}{b} = \frac{c}{d} = \frac{2}{3}$, then $\frac{a+c}{b+d}$ equals:

- a) $\frac{4}{3}$ b) $\frac{2}{3}$ c) $\frac{4}{9}$ d) $\frac{1}{3}$

24) If $\frac{a}{2} = \frac{b}{3} = \frac{c}{5}$, then each ratio equals:

- a) $\frac{a+b+c}{3}$ b) $\frac{a+2b-c}{3}$ c) $\frac{a-b+c}{10}$ d) $\frac{a-b}{5}$

25) If $\frac{4}{x} = \frac{7}{y} = \frac{a}{y-x}$, what is the value of a ?

- a) -3 b) 3 c) 11 d) 28

26) If $m - n = 6$, $\frac{3}{m} = \frac{5}{n}$, then what is the value of m ?

- a) 15 b) 9 c) -9 d) -15

27) If $\frac{x}{5} = \frac{y}{a} = \frac{3x-2y}{9}$, what is the value of a ?

- a) 6 b) 2 c) 3 d) 9

28) What is the mean proportional between a, c ?

- a) $\sqrt{a+c}$ b) $\frac{a+c}{2}$ c) $\pm\sqrt{ac}$ d) ac

29) Which of the following numbers are proportional?

- a) 2, 4, 6 b) 3, 5, 8 c) 3, 9, 27 d) 1, 4, 9

30) If a is the first proportional for the two numbers 4, 16, what is the value of a ?

- a) 8 b) 4 c) 2 d) 1

31) If b is a mean proportional between 3, 12, what is the value of b ?

- a) ± 4 b) ± 6 c) ± 9 d) ± 36



- 32) If 6 is the mean proportional between the two numbers $m, 2$, what is the value of m ?
- a) 8 b) 12 c) 18 d) 36
- 33) If x is the positive mean proportional between 24 , 54 , what is the value of x ?
- a) 15 b) 36 c) 39 d) 78
- 34) If $2b$ is a mean proportional between a , $5c$, what is the value of: $\frac{b^2}{ac}$?
- a) $\frac{5}{4}$ b) $\frac{2}{5}$ c) $\frac{3}{5}$ d) 10
- 35) If x, y, z are in continued proportion, What is the value of x ?
- a) $\pm\sqrt{yz}$ b) yz c) $\frac{y^2}{z}$ d) $\frac{y}{z}$
- 36) What is the third proportional for the numbers $x^3, 2x^2$?
- a) $2x$ b) $4x$ c) x^2 d) $2x^5$
- 37) If $7, x, \frac{1}{y}$ are in proportion, What is the value of: x^2y ?
- a) 7 b) $\frac{1}{7}$ c) 14 d) 49
- 38) If b is a mean proportional between $(12 - \sqrt{32}), (3 + \sqrt{2})$, what is the value of b ?
- a) $\pm\sqrt{7}$ b) $\pm 2\sqrt{7}$ c) $\pm 4\sqrt{7}$ d) $\pm 16\sqrt{7}$
- 39) If $\frac{a}{b} = \frac{b}{c} = 3$, then which of the following is correct?
- a) $a = 3c$ b) $a = 9b$ c) $a = 9c$ d) $a = 6c$
- 40) If $\frac{a}{b} = \frac{b}{c} = \frac{c}{5} = 2$, what is the value of a ?
- a) 5×2^2 b) 40 c) 10 d) 2×5^3
- 41) If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 2$, what is the value of $\frac{a}{d}$?
- a) 2 b) 4 c) 8 d) 16



42) The mean proportional between $(x - 2)$, $(x + 2)$ is :

- a) $\sqrt{x + 2}$ b) $x^2 - 4$ c) $\pm\sqrt{x^2 - 4}$ d) $\sqrt{x^2 - 4}$

43) If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 3$, then what is the value of : $\frac{a + b + c}{b + c + d}$?

- a) 1 b) 3 c) 9 d) 6

44) If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 4$, then what is the value of $\frac{a + d}{d}$?

- a) 65 b) 49 c) 37 d) 25

Q2 Answer the following :-

1) If $y : x = 2 : 5$, find the value of $(10x + 3y) : (5x + 2y)$.

2) If $(2x - 3) : (x - 5) = 1 : 4$ find the value of X.

3) If $4x^2 + 9y^2 = 12xy$, find the value of $\frac{x}{y}$.

4) Find the number if its square is added to both terms of the ratio 7 : 11 it becomes 4 : 5

5) If $\frac{x}{2} = \frac{y}{4} = \frac{z}{5}$, $x + y - 2z = 12$, find the value of z.

6) If a , b , c , d are proportional , prove that $\frac{a+b}{b} = \frac{c+d}{d}$

7) If b is the middle between a , c prove that $\frac{a-c}{a+b} = \frac{a-2b+c}{a-b}$

8) Find the value of x , y if x , 12 , 6 , y in continued proportion

9) If b is the middle between a , c prove that $\frac{4a^2-9b^2}{4b^2-9c^2} = \frac{a}{c}$

10) Find the value of x , y if 2 , x , y , 54 in continued proportion

11) Find the value of x if x , 24 , 144 are proportional

12) If $\frac{a}{4x+y} = \frac{b}{x-4y}$ prove that $\frac{a+b}{5x-3y} = \frac{a-b}{3x+5y}$

13) If $\frac{a}{2x-y} = \frac{b}{2y-x}$ prove that $\frac{2a+b}{a+2b} = \frac{x}{y}$

14) If $\frac{x}{a-b+c} = \frac{y}{b-c+a} = \frac{z}{c-a+b}$ prove that $\frac{x+y}{a} = \frac{y+z}{b}$

15) If $\frac{a}{2} = \frac{b}{3} = \frac{c}{4} = \frac{2a-b+5c}{3x}$ find the value of x.

Unit 2

Q1 Choose the correct answer :-

- 1) If $(x - 1, 11) = (8, y + 3)$, then $\sqrt{x + 2y} =$
- a) 5 b) ± 5 c) $\sqrt{17}$ d) 25
- 2) If $(3^x, \sqrt{y}) = (1, 4)$, then $x + y =$
- a) 2 b) 3 c) 16 d) 17
- 3) If $x > y$, $(x^3, y^2) = (1, 4)$, then $xy =$
- a) 4 b) 2 c) -2 d) -4
- 4) If $(x - 3, y) = (2, \sqrt{16})$, then $(y, x) =$
- a) (1, 4) b) (5, 4) c) (4, 1) d) (4, 5)
- 5) If $X = \{1, 2\}$, then $X \times \emptyset =$
- a) X b) $\emptyset$ c) $\{0\}$ d) $\{(1, 0), (2, 0)\}$
- 6) $\{3\} \times \{5\} =$
- a) $\{15\}$ b) $\{3, 5\}$ c) $(3, 5)$ d) $\{(3, 5)\}$
- 7) If $X = \{3, 5\}$, $Y = \{6, 7\}$, then $(6, 7) \in$
- a) $X \times Y$ b) $Y \times X$ c) X^2 d) Y^2
- 8) If $X = \{3\}$, then $X^2 =$
- a) 9 b) (3, 3) c) $\{9\}$ d) $\{(3, 3)\}$
- 9) If $X = \{3\}$, then $n(X^2) =$
- a) 1 b) 9 c) $\{3, 3\}$ d) 3
- 10) If $n(X) = 3$, $n(X \times Y) = 12$, then $n(Y) =$
- a) 4 b) 9 c) 15 d) 36
- 11) If $n(X^2) = 9$, then $n(X) =$
- a) 2 b) 3 c) 9 d) 81
- 12) If $X = \{5, 7, 9\}$ and $n(X \times Y) = 6$, then $n(Y^2) =$
- a) 4 b) 6 c) 9 d) 12

13) If $X \times Y = \{(1, 4), (1, 7), (1, 8)\}$, then $n(Y^2) = \dots\dots\dots$

- a) 1 b) 3 c) 6 d) 9

14) If $X = \{2, 3, 4, 7, 8\}$, $Y = \{1, 4, 5, 6\}$, then $n(X^2) - n(Y \times X) = \dots\dots\dots$

- a) 5 b) 10 c) 15 d) 25

15) If $n(X^2) = 9$, $n(X \times Y) = 12$, then $n(Y^2) = \dots\dots\dots$

- a) 4 b) 6 c) 9 d) 16

16) If X is a non-empty set $n(X) = n(X \times Y)$, then $n(Y) = \dots\dots\dots$

- a) 1 b) 2 c) 3 d) 4

17) If X, Y are two sets where: $n(X \times Y) = 11$, then $n(X) + n(Y) = \dots\dots\dots$

- a) 8 b) 9 c) 11 d) 12

18) If X, Y are two sets where: $n(X^2) + n(X \times Y) = 5$, then $n(Y^2) = \dots\dots\dots$

- a) 25 b) 16 c) 4 d) 1

19) To which cartesian product from the following , the point $\left(\frac{1}{2}, \sqrt{5}\right)$ belongs to?

- a) $\mathbb{N} \times \mathbb{N}$ b) $\mathbb{Z} \times \mathbb{Z}$ c) $\mathbb{Q} \times \mathbb{Q}$ d) $\mathbb{R} \times \mathbb{R}$

20) Which of the following ordered pairs belongs to $\mathbb{Q} \times \mathbb{Q}$?

- a) $(\sqrt[3]{1}, \sqrt{2})$ b) $(-\sqrt[3]{16}, -5)$ c) $\left(\sqrt{\frac{4}{9}}, -\frac{1}{2}\right)$ d) $\left(\sqrt[3]{27}, -\sqrt{\frac{1}{8}}\right)$

21) If the function $f: X \rightarrow Y$, then the range of the function f is a subset of

- a) $X \times Y$ b) X c) $Y \times X$ d) Y

22) If $f(x) = x^2 - x + 3$, what is the value of $f(-2)$?

- a) -2 b) -1 c) 5 d) 9

23) If $f(x) = x^2 - \sqrt{2}x$, what is the value of $f(\sqrt{2})$?

- a) 4 b) 2 c) 6 d) 0

- 24)** If the function $f: \mathbb{Z} \rightarrow \mathbb{Z}$ where $f(x) = x^2$, then $f(2) + f(-2) = \dots\dots\dots$
a) 0 b) 4 c) 8 d) -8
- 25)** If $f(x) = x^2$, $g(x) = x + 4$, What is the value of : $5f(2) + 2g(5)$?
a) 18 b) 20 c) 38 d) 70
- 26)** If $f(x) = kx + 8$, $f(2) = 0$, What is the value of k ?
a) 8 b) 6 c) 4 d) -4
- 27)** If $f(x) = x - 5$, and $\frac{1}{2}f(a) = 3$, What is the value of a ?
a) 2 b) 8 c) 11 d) 16
- 28)** If $(-1, 0)$ belongs to the function f where $f(x) = mx + 2$, What is the value of m ?
a) 0 b) -1 c) 2 d) -2
- 29)** If $(3, y)$ belongs to the function f where $f(x) = x + 2$, what is the value of y ?
a) 5 b) 3 c) 2 d) 1
- 30)** If (a, a) belongs to the function f where $f(x) = 2x + 3$, what is the value of a ?
a) 2 b) 3 c) -3 d) -2
- 31)** If $X = \{2, 4, 6\}$, $n(Y) = 4$ and the function $f: X \rightarrow Y$, $f(x) = x^2 - 1$, then Y can be
a) $\{3, 7, 13\}$ b) $\{3, 15, 25, 45\}$ c) $\{3, 15, 35\}$ d) $\{3, 15, 25, 35\}$
- 32)** The straight line representing the function f where $f(x) = 3x - 12$ cuts the x -axis at the point
a) $(-12, 0)$ b) $(12, 0)$ c) $(4, 0)$ d) $(-4, 0)$
- 33)** The straight line representing the function f where $f(x) = 6 - 2x$ cuts the y -axis at the point
a) $(0, -6)$ b) $(0, -3)$ c) $(0, 3)$ d) $(0, 6)$

34) The ordered pair $(1, 2)$ belongs to the function f where:

a) $f(x) = 2x - 1$

b) $f(x) = -3x + 7$

c) $f(x) = 2x + 1$

d) $f(x) = -3x + 5$

35) If $f(x) = 7$, then $f(-3) = \dots\dots\dots$

a) 7

b) -7

c) 21

d) -21

36) If $f(x) = 2$, then $3f(\sqrt{2}) = \dots\dots\dots$

a) $f(3\sqrt{2})$

b) $3\sqrt{2}$

c) 6

d) $2\sqrt{3}$

37) If $f(x) = 2$, then $f(3) - f(1) = \dots\dots\dots$

a) $f(2)$

b) 2

c) 0

d) 4

38) If $f: \mathbb{R} \rightarrow \mathbb{R}$ and $f(x) = 3$, then $\frac{f(6)}{f(0)} = \dots\dots\dots$

a) 6

b) 1

c) 3

d) undefined

39) If $f: \mathbb{R} \rightarrow \mathbb{R}$ and $f(x) = 7$, what is the value of $\frac{5f(4)}{10f(6)}$?

a) $\frac{1}{3}$

b) $\frac{1}{2}$

c) $\frac{7}{3}$

d) $\frac{7}{2}$

40) The function $f: \mathbb{R} \rightarrow \mathbb{R}$ where $f(x) = 5$ is represented by a straight line that intersects the y-axis at the point $\dots\dots\dots$

a) $(5, 0)$

b) $(0, 5)$

c) $(-5, 0)$

d) $(0, -5)$

41) If the straight line representing the function f where $f(x) = 2x - a$ passes through the origin, then $a = \dots\dots\dots$

a) -2

b) 2

c) 0

d) 3

- 42) If the straight line representing the function f where $f(x) = kx + 4$ passes through the point $(1, 1)$, what is the value of $f(-1)$?
- a) -7 b) -1 c) 1 d) 7
- 43) If the straight line representing the function f where $f(x) = 2x + b$ passes through the point $(-1, 5)$, what is the value of $f(0)$?
- a) -7 b) -5 c) 5 d) 7
- 44) If the point $(k, 5)$ lies on the straight line representing the function f where $f(x) = 2x - 7$, what is the value of k ?
- a) 3 b) 4 c) 5 d) 6
- 45) If $(5k, k)$ belongs to the function f where $f(x) = 3x + 14$, what is the value of k ?
- a) 14 b) 10 c) -7 d) -1
- 46) If $g(x) = 4$, $f(x) = -3$, what is the perpendicular distance between the two straight lines representing the two functions f, g ?
- a) 1 b) 3 c) 5 d) 7
- 47) Which of the following equations is an equation of the first degree in one variable?
- a) $x + y = 12$ b) $2x - \frac{2}{x} = 0$ c) $2\sqrt{x} + 3 = 5$ d) $2x - 4 = 3$
- 48) The solution set of the equation: $5x - 7 = 2x + 5$ in $\mathbb{R}$ is
- a) $\{4\}$ b) $\{3\}$ c) $\{5\}$ d) $\{2\}$
- 49) What is the solution set of the equation: $\sqrt{2}x - 1 = 1$ in $\mathbb{R}$?
- a) $\{2\}$ b) $\{1\}$ c) $\{\sqrt{2}\}$ d) $\emptyset$

50) The solution set of the equation: $\frac{y+2}{3} = \frac{y-1}{2}$ in $\mathbb{R}$ is

- a) $\{-5\}$ b) $\{7\}$ c) $\{-7\}$ d) $\{5\}$

51) Which of the following inequalities is an inequality of the first degree in one variable?

- a) $x^2 - x \geq 3$ b) $0.4t - 7 < 2t$ c) $\frac{2}{t} + t > 5$ d) $3x < 2y + 5$

52) Which of the following inequalities expresses the solution set in $\mathbb{R}$ represented by the given figure?



- a) $x > 3$ b) $x < 3$ c) $x \geq 3$ d) $x \leq 3$

53) Which of the following inequalities expresses the solution set in $\mathbb{R}$ represented by the given figure?



- a) $-4 < x < 4$ b) $-4 \leq x < 4$ c) $-4 < x \leq 4$ d) $-4 \leq x \leq 4$

54) What is the solution set of the inequality $2x < 14$ in $\mathbb{R}$?

- a) $] -\infty, 7[$ b) $] -7, \infty[$ c) $] 7, \infty[$ d) $[7, \infty[$

55) What is the solution set of the inequality $3 \geq x > -2$ in $\mathbb{R}$?

- a) $] -2, 3]$ b) $[-2, 3[$ c) $[-2, 3]$ d) $] -2, 3[$

56) What is the solution set of the inequality $-x > 3$ in $\mathbb{R}$?

- a) $] -\infty, -3[$ b) $] -\infty, 3[$ c) $] -3, \infty[$ d) $] 3, \infty[$

57) What is the solution set of the inequality $5 > -x > -3$ in $\mathbb{R}$?

- a) $[-5, 3]$ b) $] -5, 3[$ c) $[-3, 5]$ d) $] -3, 5[$

58) The solution set of the inequality $-1 < x - 5 < 1$ in $\mathbb{R}$ is

- a) $[4, 6]$ b) $] 4, 6[$ c) $] 4, 6]$ d) $[4, 6[$

59) The interval $[-1, 2[$ is the solution set in $\mathbb{R}$ for the inequality

- a) $-1 < x < 2$ b) $-1 < x < 2$ c) $-1 \leq x < 2$ d) $-1 \leq x \leq 2$

60) If $-2 < 2x < 6$, then $x \in$

- a) $] -1, 3[$ b) $] -1, 3]$ c) $[-1, 3[$ d) $[-1, 3]$

61) If $3 > x > -3$ where $x \in \mathbb{R}$, then $2x$ belongs to

- a) $] -5, 5[$ b) $[-6, 6]$ c) $] -6, 6]$ d) $] -6, 6[$

62) If $2 > x > -2$ where $x \in \mathbb{R}$, then $2x + 3$ belongs to

- a) $[-1, 7]$ b) $] -1, 5[$ c) $] -1, 7[$ d) $] -4, 6[$

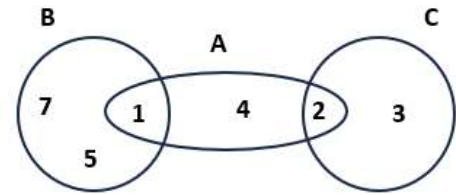
63) The number 5 belongs to the solution set of the inequality

- a) $x > 5$ b) $x < 5$ c) $-x \geq -5$ d) $-x \geq 5$

Q2 Answer the following :-**1) Using the opposite venn diagram find :**

a) $(A \cap C) \times B$

b) $(C \cup B) \times B$

**2) If $A = \{1, 7, 9\}$, $B = \{2, 4, 7\}$, $C = \{1, 7\}$, find :****a) $A \times C$ and represent it by arrow diagram**

b) $B \times (A \cup C)$

3) If $X = \{1, 3, 5\}$, $Y = \{1, 2, 4, 5, 6\}$ and $\mathbb{R}$ is a relation from X to Y , where $a\mathbb{R}b$ means $a+b=7$, for each $a \in X$, $b \in Y$ **a) Write the relation $\mathbb{R}$ as a set of ordered pairs****b) Write the relation $\mathbb{R}$ in a table****c) Represent the relation by an arrow diagram****d) Represent the relation by a cartesian diagram****e) Find its domain and range****4) If $f(X) = 3X + b$, $f(4) = 15$, find the value of $5b^2 + 2b - 20$**

5) If $X = \{4, 3, 2\}$, and $\mathbb{R}$ is a relation from X to X , which $a\mathbb{R}b$ means $b+a=\text{even number}$, $a \in X$, $b \in Y$

- a) Write the relation $\mathbb{R}$ as a set of ordered pairs
- b) Write the relation $\mathbb{R}$ in a table
- c) Represent the relation by an arrow diagram
- d) Represent the relation by a cartesian diagram
- e) Is the relation is a function ? why ?

6) Represent the following graphically :

1) $f(X) = 2X - 1$

2) $f(X) = 3X$

3) $f(X) = 5$

7) If $f(x) = 2x + k$, the point (3 , 11) lies on the straight line which represent the function f , find the value of $f(2)$, k

8) If $f(x) = 2x + b$, the point (3 , 10) lies on the straight line which represent the function f , find the value of $f(5)$, b

9) Find the solution set in $\mathbb{R}$ of the equation $2x - \sqrt{2} = 5\sqrt{2}$

10) Find the solution set in $\mathbb{R}$ of the equation $4(x + 5) + 3 = 2x + 11$

11) Find the solution set in $\mathbb{R}$ of the equation $6x - 5 = 2x + 11$

12) Use the inequality to express the set of real numbers greater than 5 and less than 8 then represent on the number line

13) Find the solution set of the following inequality in $\mathbb{R}$ and represent it on the number line $5 - 3x \geq 2$

14) If $f(X) = 5X + b$, $f(2) = 12$, find the value of $b^2 - 2b - 1$

Unit 3

Q1 Choose the correct answer :-

1) The sum of the lengths of any two sides in a triangle the length of the third side.

- a) is less than b) is greater than c) is equal to d) half

2) The length of any side in a triangle the sum of the lengths of the other two sides.

- a) $>$ b) $<$ c) $=$ d) is double

3) If the lengths of two sides in a triangle are 7 cm and 4 cm then the length of the third could be

- a) 1 cm b) 2 cm c) 3 cm d) 4 cm

4) In $\triangle ABC$, if $AB = 3$ cm, $BC = 5$ cm, and $AC = x$ cm, then : $x \in$

- a) $]3, 5[$ b) $]2, 5[$ c) $]5, 8[$ d) $]2, 8[$

5) In $\triangle ABC$, $AB + BC - AC$

- a) $> \text{zero}$ b) $< \text{zero}$
c) $= \text{zero}$ d) = the perimeter of $\triangle ABC$

6) In the given figure:

Which of the following statements is true?



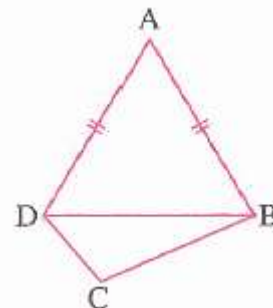
- a) $AB < CD$ b) $AC < BD$ c) $AC > BD$ d) $AC = BD$

7) In the given figure:

$m(\angle DBC) < m(\angle BDC)$, $AB = AD$

then: $m(\angle ABC)$ $m(\angle ADC)$

- a) $<$ b) $>$
c) $=$ d) $\geq$



8) If $AB = 7$ cm, $BC = 5$ cm, $AC = 6$ cm, then the smallest angle in measure is

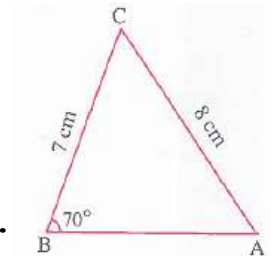
- a) $\angle A$ b) $\angle B$ c) $\angle C$ d) $\angle ABC$

9) In $\triangle EFG$: If $FG > EF$, then $m(\angle E) > \dots\dots\dots$

- a) 90° b) $m(\angle GEF)$ c) $m(\angle F)$ d) $m(\angle G)$

10) In the given figure: $m(\angle A)$ could be equal

- a) 70° b) 80°
c) 60° d) 75°

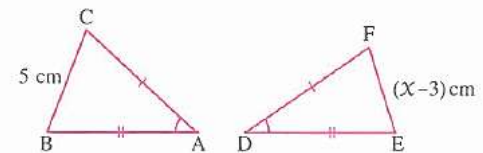


11) If ABC is a triangle in which: $m(\angle B) = 90^\circ$ then:

- a) $BC < AC$ b) $AC < AB$ c) $AC < BC$ d) $AC = AB$

12) In the given figure: If $m(\angle A) > m(\angle D)$, What is the possible value of from the following values?

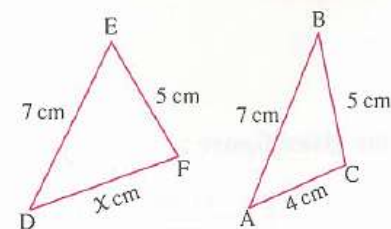
- a) 2 b) 3
c) 7 d) 9



13) In the given figure:

If $m(\angle E) > m(\angle B)$, what is the inequality that expresses the possible values of x ?

- a) $2 < x < 12$ b) $4 < x < 12$
c) $4 < x < 16$ d) $x > 12$



14) The projection of a point on given a straight line is

- a) a point. b) a line segment.
c) a ray. d) straight line.

15) The projection of a line segment on a straight line that is not perpendicular to it is

- a) a ray. b) a point.
c) a line segment. d) a straight line.

16) The length of the projection of a line segment on a given straight line is the length of the line segment itself.

- a) $\leq$ b) $>$ c) $\geq$ d) $=$

17) The length of the projection of a line segment on a given perpendicular straight line

- a) is greater than the length of the original segment.
b) equals the length of the original segment.
c) is greater than or equal to the length of the original segment.
d) equals zero.

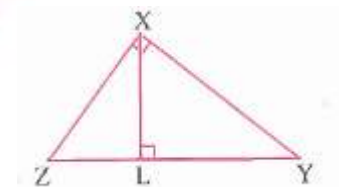
18) If $\overline{XY} \parallel \overline{AB}$, then the length of the projection of $\overline{AB}$ on $\overline{XY}$ the length of $\overline{AB}$

- a) $>$ b) $<$ c) $=$ d) $\geq$

19) In the given figure:

$$LZ \times YL = \dots\dots\dots$$

- a) $(XL)^2$ b) $(XY)^2$
c) $(XZ)^2$ d) $(YZ)^2$



20) The circumference of the circle =

- a) $2\pi r$ b) πr c) $4\pi r$ d) $2\pi d$

21) What is the circumference of a circle with a radius length of 20 cm ?

- a) 10π cm b) 20π cm c) 40π cm d) 80π cm

22) What is the area of the circle whose radius length is 10 m ?

- a) 5π m² b) 10π m² c) 25π m² d) 100π m²

23) What is the area of a circle whose diameter length is 1.4 cm? ($\pi \approx \frac{22}{7}$)

- a) 1.4 cm^2 b) 1.08 cm^2 c) 1.54 cm^2 d) 6.16 cm^2

24) In any circle, what is the value of $\frac{C}{d}$?

- a) $\frac{\pi}{2}$ b) $\frac{2}{\pi}$ c) π d) 2π

25) The radius length of a circle is 1 foot, then its area = square feet.

- a) $\frac{1}{2}\pi$ b) π c) 2π d) π^2

26) $\pi =$

- a) $\frac{C}{r}$ b) $\frac{C}{2r}$ c) $\frac{2C}{r}$ d) $\frac{C}{3r}$

27) What is the radius length of a circle whose circumference is 13π cm ?

- a) $\frac{\pi}{2}$ cm b) 6.5 cm c) 13 cm d) 26 cm

28) What is the diameter length of a circle whose area is 36π square inches?

- a) 6 inches b) 12 inches c) 18 inches d) 36 inches

29) The area of a circle is $4\pi \text{ cm}^2$. What is its circumference?

- a) $16\pi^2$ cm b) 16π cm c) 8π cm d) 4π cm

30) The circumference of a circle is 10π cm, what is its area?

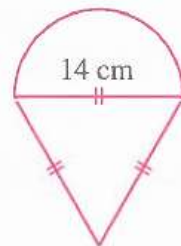
- a) $25\pi \text{ cm}^2$ b) $50\pi \text{ cm}^2$ c) $75\pi \text{ cm}^2$ d) $100\pi \text{ cm}^2$

31) The areas of two circles are 64π , 100π , what is the ratio between their circumferences?

- a) 3 : 4 b) 4 : 5 c) 9 : 16 d) 16 : 25

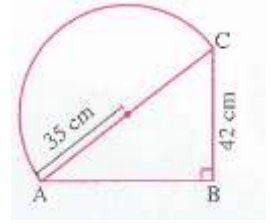
32) The perimeter of the figure =

- a) $14(\pi + 3)\text{cm}$ b) $7(\pi + 6)\text{cm}$
c) $14(\pi + 2)\text{cm}$ d) $7(\pi + 4)\text{cm}$



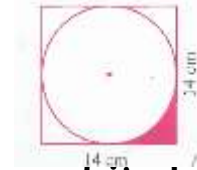
33) The perimeter of the figure $\approx$ where ($\pi \approx 3.14$)

- a) 208 cm b) 278 cm
c) 318 cm d) 388 cm



34) The perimeter of the colored part $\approx$ where ($\pi \approx 3.14$)

- a) 11 cm b) 14 cm
c) 25 cm d) 36 cm



35) A right circular cylinder, whose base radius length is r cm and its height is h cm . , what is its volume?

- a) $\frac{1}{2}\pi r^2 h \text{ cm}^3$ b) $\pi r^2 h \text{ cm}^3$ c) $2\pi r^2 h \text{ cm}^3$ d) $\pi r h^2 \text{ cm}^3$

36) A right circular cylinder whose base radius length is r cm and its height is h cm , what is its surface area?

- a) $2\pi rh$ b) $2\pi r^2 h$ c) $2\pi r(h + r)$ d) $2\pi h(h + r)$

37) A right circular cylinder whose base radius length is 5 cm , and its height is 15 cm , what is its surface area?

- a) $75\pi \text{ cm}^2$ b) $200\pi \text{ cm}^2$ c) $250\pi \text{ cm}^2$ d) $375\pi \text{ cm}^2$

38) A right circular cylinder whose base diameter length is 10 cm. and its height is 15 cm. , what is its volume?

- a) $75\pi \text{ cm}^3$ b) $150\pi \text{ cm}^3$ c) $375\pi \text{ cm}^3$ d) $1500\pi \text{ cm}^3$

39) A right circular cylinder whose volume is $320\pi \text{ cm}^3$, and its height is 20 cm. , what is the diameter length of its base?

- a) 2 cm b) 4 cm c) 8 cm d) 16 cm

40) If the lateral area of a right circular cylinder equals $2\pi r^2 \text{ cm}^2$, what is its height?

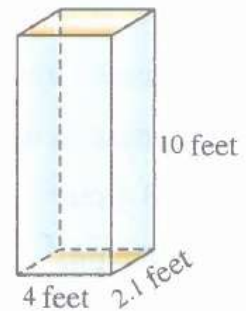
- a) $\frac{1}{2}r \text{ cm}$ b) $\frac{3}{4}r \text{ cm}$ c) $r \text{ cm}$ d) $2r \text{ cm}$

41) A right circular cylinder whose base circumference is $14\pi \text{ cm}$ and its height is 3 cm , what is its volume?

- a) $49\pi \text{ cm}^3$ b) $98\pi \text{ cm}^3$ c) $147\pi \text{ cm}^3$ d) $196\pi \text{ cm}^3$

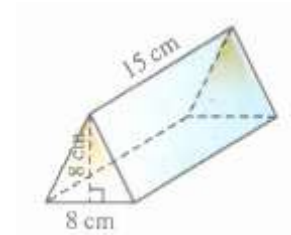
42) What is the volume of the given rectangular prism?

- a) 64 cubic feet. b) 76 cubic feet.
c) 84 cubic feet. d) 122 cubic feet.



43) What is the volume of the given triangular prism?

- a) 160 cm^3 b) 320 cm^3
c) 400 cm^3 b) 480 cm^3



44) A prism with a square base of side length 7 cm and a height of 4 cm , then it has a lateral area of cm^2

- a) 28 b) 56 c) 84 d) 112

45) If the base of a right prism is an equilateral triangle with side length 5 cm . and the height of the prism equals 4 cm , what is the lateral area of the prism?

- a) 15 cm^2 b) 30 cm^2 c) 60 cm^2 d) 240 cm^2



- 46) A right pentagonal prism whose base is a regular pentagon with area 10 m^2 , and the area of one of its lateral rectangles is 9 m^2 . what is the total area of the prism?
- a) 19 m^2 b) 38 m^2 c) 55 m^2 d) 65 m^2
- 47) What is the distance between the point $A(-3,4)$ and the origin point?
- a) 3 units of length. b) 4 units of length.
c) 5 units of length. d) 7 units of length.
- 48) The distance between the point $(\sqrt{3}, 1)$ and the origin point is unit(s) of length.
- a) 4 b) 3 c) 2 d) 1
- 49) If O is the origin point, $A(x, 5)$ and $OA = 13$ units of length, what is the value of x ?
- a) -12 b) 12 c) ± 12 d) 144
- 50) The distance between the two points $(3, a), (-1, a)$ is units of length.
- a) 16 b) 9 c) 5 d) 4
- 51) What is the length of the radius of the circle whose center is $(7, 4)$ and passes through the point $(3, 1)$?
- a) 5 units of length. b) -5 units of length.
c) 2.5 units of length. d) 25 units of length.
- 52) If ABCD is a square, $A(3, 5), B(4, 2)$ what is the area of the square ABCD?
- a) $\sqrt{10}$ square units. b) 10 square units.
c) $4\sqrt{10}$ square units. d) 40 square units.



53) What is the distance between the point $(-5, -2)$ and the y - axis ?

- a) -5 units of length. b) -2 units of length.
c) 2 units of length. d) 5 units of length.

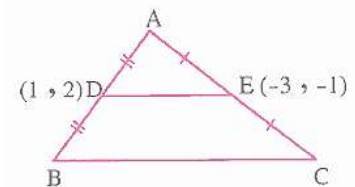
54) What is the distance between the point $(-4, \ell)$ and the x - axis where $\ell \in \mathbb{R}$?

- a) 4 units of length. b) ℓ units of length.
c) -4 units of length. d) $|\ell|$ units of length.

55) In the given figure:

What is the length of $\overline{BC}$?

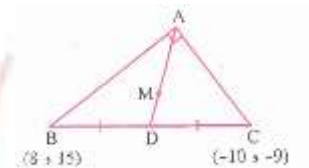
- a) 12 units of length. b) 10 units of length.
c) 8 units of length. d) 5 units of length.



56) In the given figure:

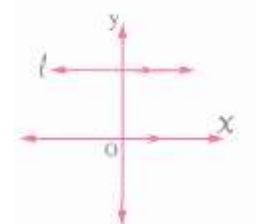
If M is the intersection point of the medians of triangle ABC , what is the length of $\overline{DM}$?

- a) 5 units of length. b) 6 units of length.
c) 7 units of length. d) 8 units of length.



57) In the given figure: What is the slope of the straight line ℓ ?

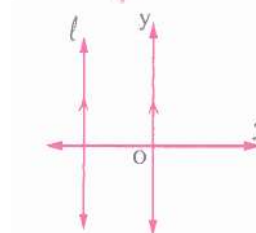
- a) 1 b) -1
c) 0 d) undefined



58) In the given figure:

What is the slope of the straight line ℓ ?

- a) 1 b) -1
c) 0 d) undefined



59) In the given figure:

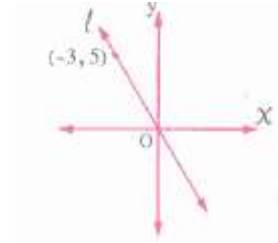
What is the slope of the straight line ℓ ?

a) $\frac{5}{3}$

b) $\frac{3}{5}$

c) $-\frac{3}{5}$

d) $-\frac{5}{3}$



60) In the given figure:

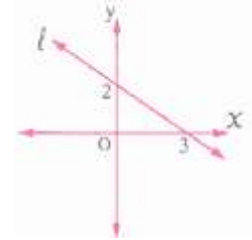
What is the slope of the straight line ℓ ?

a) $\frac{2}{3}$

b) $-\frac{2}{3}$

c) $\frac{3}{2}$

d) $-\frac{3}{2}$



61) What is the slope of the straight line passing through the two points

A(3, 2), B(4, 2) ?

a) 2

b) 1

c) 0

d) undefined

62) If the slope of the straight line passing through the two points

$(-4, k)$, $(6, -7)$, equal $-\frac{1}{3}$, what is the value of k ?

a) 23

b) -23

c) $\frac{11}{3}$

d) $-\frac{11}{3}$

63) In the given figure:

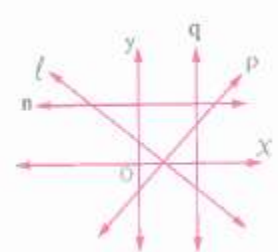
Which of the four straight lines has a negative slope?

a) ℓ

b) n

c) q

d) p



64) In the given figure:

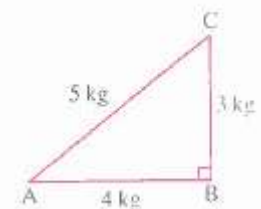
What is the slope of the road $\overrightarrow{AC}$?

a) $\frac{4}{3}$

b) $\frac{3}{4}$

c) $\frac{3}{5}$

d) $\frac{4}{5}$



65) The points in the table lie on a straight line.
What is the slope of the straight line?

a) $-\frac{1}{3}$

b) -3

c) -4

d) 4

x	-3	-2	-1	0
y	5	2	-1	-4

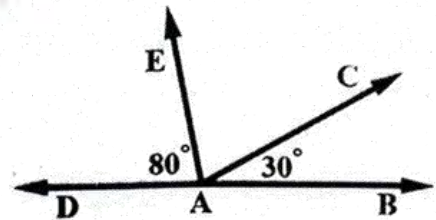
Q2 Answer the following :-1) In the opposite figure

if the points A,B,C and D are collinear , $AB < DC$ prove that $DB > AC$

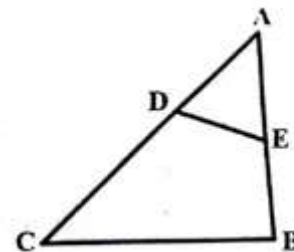
2) In the opposite figure

$A \in \overleftrightarrow{DB}$, $m(\angle CAB) = 30^\circ$, $m(\angle EAD) = 80^\circ$

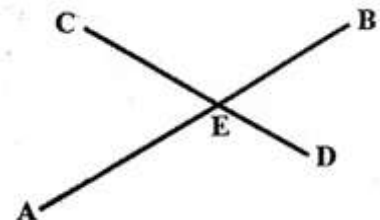
Prove that $m(\angle DAC) > m(\angle BAE)$

3) In the opposite figure

ABC is triangle in which $AC > AB$, $D \in \overline{AC}$, $E \in \overline{AB}$, such that $m(\angle ADE) = m(\angle AED)$, prove that $DC > EB$

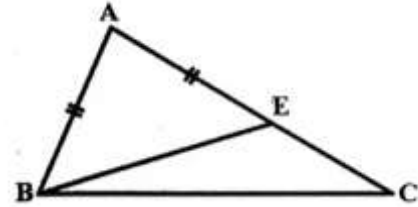
4) In the opposite figure

$EB > ED$, $EA > EC$, prove that $AB > CD$



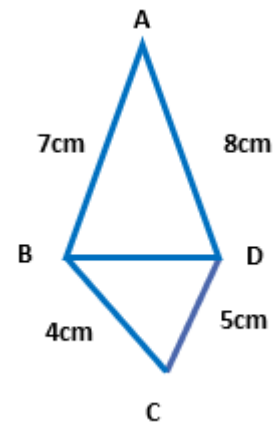
5) In the opposite figure

$C \in \overline{AE}$, $AB = AE$ Prove $m(\angle ABE) > m(\angle C)$

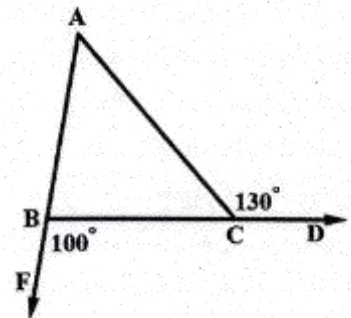


6) ABC is a triangle in which $m(\angle A) = 30^\circ$, $m(\angle B) = 70^\circ$, arrange the side lengths of the triangle in a descending order .

7) ABCD is a quadrilateral in which $AB=7\text{cm}$, $BC=4\text{cm}$, $CD=5\text{cm}$, $AD=8\text{cm}$.
Prove $m(\angle ABC) > m(\angle ADC)$



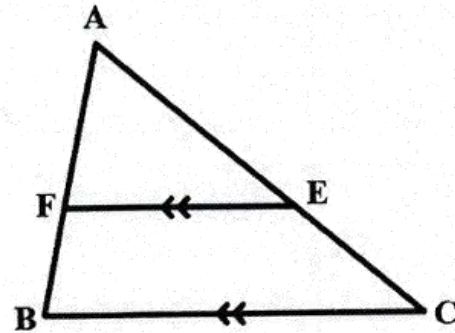
8) ABC is a triangle in which $D \in \overline{BC}$, $F \in \overline{AB}$,
 $m(\angle ACD) = 130^\circ$, $m(\angle FBC) = 100^\circ$,
prove that $AC > AB$



9) In the opposite figure

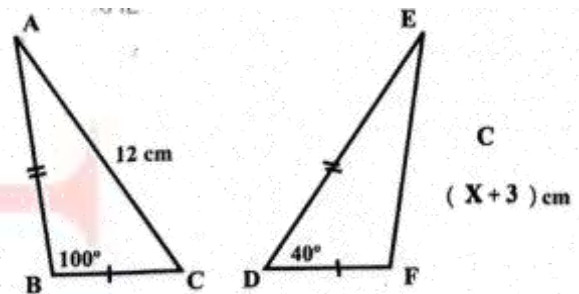
ABC is a triangle in which $AC > AB$

$\overline{FE} \parallel \overline{BC}$, Prove $m(\angle AFE) > m(\angle AEF)$



10) In the opposite figure

Find all possible values of x .

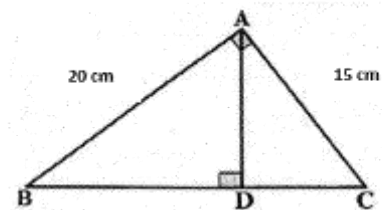


11) In the opposite figure find the length of

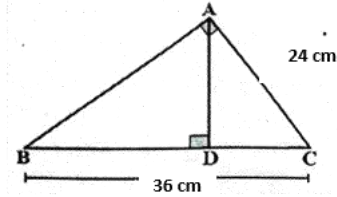
Projection of $\overline{AC}$ on $\overline{BC}$

Projection of $\overline{AB}$ on $\overline{BC}$

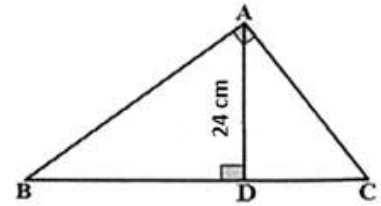
Projection of $\overline{AD}$ on $\overline{BC}$



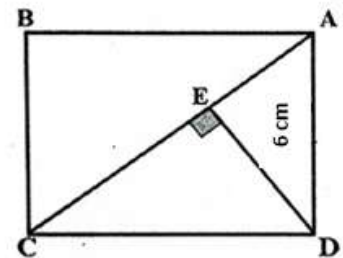
12) In the opposite figure find the length of AB , DC



13) In the opposite figure find the length of DC × DB



14) ABCD is a rectangle its area is 48 cm^2 $DE \perp AC$,
AD = 6cm . find CD , AC , ED

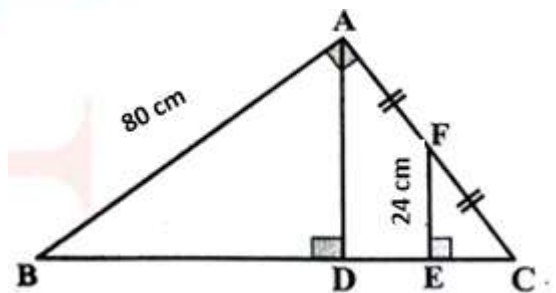


15) In the opposite figure

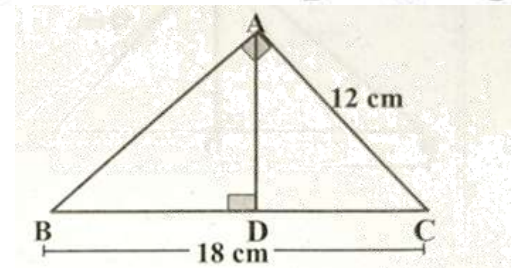
$AD \perp BC$, $m(\angle BAC) = 90^\circ$

$FE = 24 \text{ cm}$, $AB = 80 \text{ cm}$, $FA = FC$

Find EC .



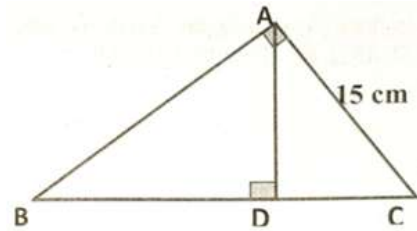
16) In the opposite figure: find DC



17) In the opposite figure:

ABC is a triangle, its area is 150 cm^2

Find: AB, AD



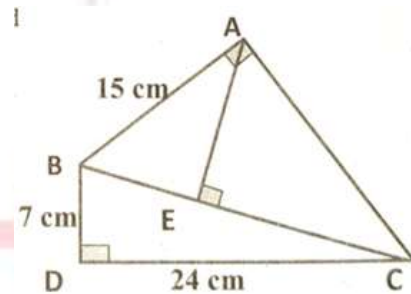
18) In the opposite figure:

ABC is a right-angled triangle at A,

BDC is a right-angled triangle at D,

$AE \perp BC$.

Find: BC, AC, AE



19) Draw a circle N with a diameter of 6cm.

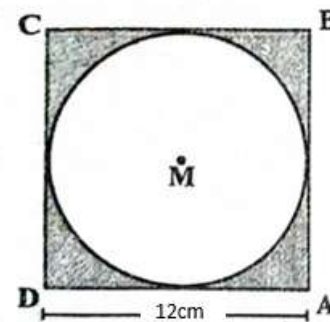
20) Find the circumference of the circle with a diameter of 8 feet ($\pi \approx 3.14$)

21) A truck tire has a diameter of 120cm , what is the circumference of the tire ? if the tire makes a complete revolution what distance does the truck cover ?

How many revolutions does the tire need to cover a distance of 200 Km? ($\pi \approx 3.14$)

22) Find the area of a circle with a radius of 12 cm ? ($\pi \approx 3.14$)

23) Circle M touches the sides of squares ABCD from the inside where AD = 12cm. Find the circumference and area of the shaded region ($\pi \approx 3.14$)



24) Right circular cylinder has a base diameter of 12 cm and a height of 8 cm. Find its volume, lateral area, and total area. ($\pi = 3.14$)

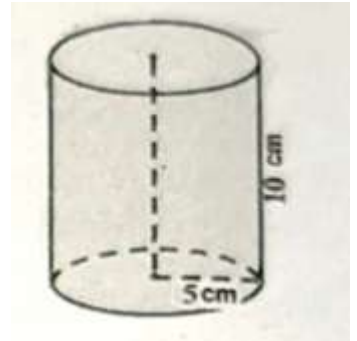
25) Right circular cylinder has a volume of 1540 cm^3 and a base radius of 7 cm. Find its height, lateral area. ($\pi = \frac{22}{7}$)

26) A right quadrilateral prism has a square base with a side length of 8 cm and a height of 10 cm. Find the volume of the prism, its total area.

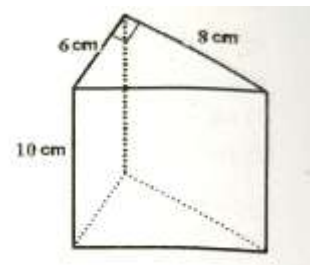
27) A right triangular prism has a height of 10 cm and a volume of 120 cm^3 . Find the area of its base.

28) Which one has a larger volume? Right circular cylinder has a base diameter of 14 cm and a height of 10 cm, or a right quadrilateral prism has a square base with a side length of 10 cm and a height of 14 cm.

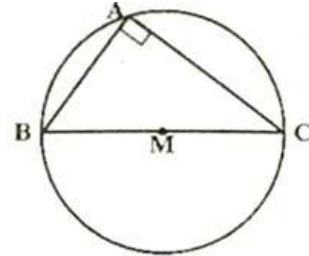
29) In the figure opposite: A right circular cylinder with a radius of 5 cm and a height of 10 cm. Find the volume of the cylinder.



30) In the figure opposite: A right triangular prism with a height of 10 cm and a base that is a right triangle, with the lengths of the legs being 6 cm, 8 cm. Find the lateral area of the prism.



31) In the figure opposite: $AB = 6$ cm, $AC = 8$ cm. Find the area and circumference of circle M in terms of π .



32) If $A(3, -5)$, $B(7, -2)$ find AB .

33) If the distance between the two points $B(3, 2)$, $A(K, 8)$ is equal to 10 units of length find the value of K .

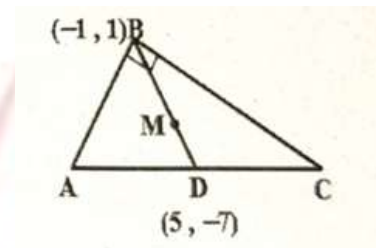
34) If $A(3, 1)$, $B(-5, 1)$, $C(-1, 4)$ prove that the points A, B, C are not collinear.

35) If $A(0, 6)$, $B(6, 0)$, $C(2, -4)$, $D(-4, 2)$ prove that the points A, B, C, D are the vertices of a rectangle.

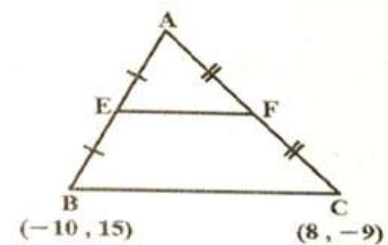
36) Find the area of the circle whose center is the point $M(-3, 2)$ and passes through the point $A(3, -6)$

37) Find the circumference of the circle whose center is $M(15, 10)$ and passes through the point $A(3, -6)$.

38) In the opposite figure, M is the intersection point of the medians of triangle ABC . Find AC .



39) In the opposite figure, find EF .

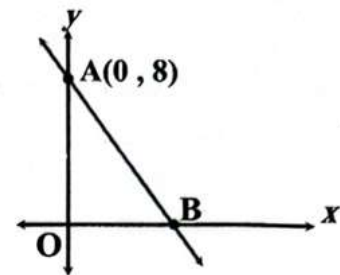


40) If the slope of the straight line passing through the two points $(k, 9)$, $(7, 2)$ is 7, find the value of k .

41) If the straight line passes through the two points $(5, 1)$, $(3, k)$ and is parallel to x -axis, find the value of k .

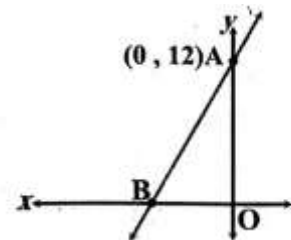
42) In the opposite figure:

If the area of triangle OAB is 20 square units, find the slope of the straight line AB .



43) In the opposite figure:

If the area of triangle OBA is 18 square units, find the slope of the straight line AB .



Unit 4**Q1 Complete the following :-**

- 1) From the data collection methods: ,
- 2) Data collection sources are divided into two types: ,
- 3) The methods of selecting samples are: ,
- 4) Types of random samples:
 - (1) The random sample. It is used in homogeneous populations.
 - (2) The random sample. It is used in non-homogeneous populations
- 5) From the advantages of the mass population method for data collection , and its disadvantages
- 6) From the advantages of the sampling method: and its disadvantages

Q2 Choose the correct answer:

- 1) From the primary sources for collecting data
 - (a) bulletins of statistical centers.
 - (b) data of school students from last year.
 - (c) surveys.
 - (d) records of employee data from one of the institutions.
- 2) All of the following are primary sources of data except
 - (a) opinion polls.
 - (b) observation and measurement.
 - (c) websites.
 - (d) personal interview.

- 3) From the secondary sources for collecting data**
- (a) personal interview.
 - (b) surveys.
 - (c) employee database.
 - (d) observation and measurement.
- 4) All of the following are considered secondary data sources except**
- (a) media.
 - (b) central agency for public mobilization and statistics bulletins.
 - (c) registered student data at the school.
 - (d) asking students about their personal data.
- 5) One of the disadvantages of using secondary sources to obtain data about a statistical population**
- (a) requires a lot of time and effort.
 - (b) requires a large number of researchers in the case of large population.
 - (c) high cost.
 - (d) inaccuracy.
- 6) Mass population method is used to collect data in the case of**
- (a) patient's blood test.
 - (b) quality testing of factory production.
 - (c) petrol exploration in a certain area.
 - (d) elections.

- 7)** Sampling method is used to collect data in the case of
- (a) elections.
 - (b) final exam for students in the school.
 - (c) research on the spread of infection among the fruits of a certain crop.
 - (d) small statistical population.
- 8)** One of the advantages of the sampling method
- (a) accuracy.
 - (b) comprehensive.
 - (c) the complete representation of all items in the population.
 - (d) saving time and effort.
- 9)** The sample method is considered the appropriate method for each of the following except
- (a) examining factory production.
 - (b) examining desert sands.
 - (c) knowing mass population.
 - (d) examining a patient's blood.
- 10)** Choosing the sample from only one layer of the statistical population is called the
- (a) randomness.
 - (b) layering.
 - (c) biased.
 - (d) simple.
- 11)** A factory has 75 technicians, 50 engineers. If a sample of size 50 individuals is to be chosen representing each layer according to its size, then the number of engineers in this sample equals engineer.
- (a) 30
 - (b) 20
 - (c) 25
 - (d) 15

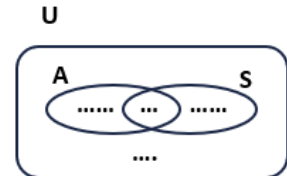
- 12)** A hospital has 40 doctors, 200 nurses, a layer sample of size 36 individuals was taken in which each layer is represented according to its size, then the number of nurses in this sample equals nurses.
- (a) 6 (b) 18 (c) 24 (d) 30
- 13)** If the probability of a football team winning in a single match is 0.75, how many matches are expected to win out of a total of 24 matches?
- (a) 6 (b) 12 (c) 18 (d) 20
- 14)** A factory produces 800 bulbs daily. If the probability that the bulb is defective is 0.03, then the expected number of working bulbs produced in one day is bulbs.
- (a) 24 (b) 124 (c) 560 (d) 776
- 15)** A random sample of size 20 apples was selected from a shipment of apples, the number of corrupted apples was 2. If the total number of apples in the shipment was 2240 apples, what is the expected number of good apples in the shipment?
- (a) 224 (b) 18 (c) 2016 (d) 2220
- 16)** The probability of obtaining a good rice crop in a village is $\frac{3}{5}$, and farmers planted X feddans of rice. If the expected number of feddans to produce a good crop is 30 feddans, what is the value of X?
- (a) 18 (b) 36 (c) 42 (d) 50
- 17)** In a mixed school with 1200 students, a random sample of 90 students was chosen and it was found that the number of girls is 54, what is the expected number of girls in the school?
- (a) 480 girls (b) 660 girls (c) 720 girls (d) 840 girls

- 18)** If the school media team consists of 18 members, including 4 teachers, 6 female students, 8 male students. If one of the team members was chosen randomly to give a speech, what is the probability that it is a male student or a teacher?
- (a) $\frac{2}{9}$ (b) $\frac{1}{3}$ (c) $\frac{4}{9}$ (d) $\frac{2}{3}$
- 19)** The team work in one of the factories consists of 80 workers and 16 engineers, if one member of the team was randomly selected, then the probability that he is a worker equals
- (a) $\frac{1}{6}$ (b) $\frac{1}{3}$ (c) $\frac{2}{3}$ (d) $\frac{5}{6}$
- 20)** A player shot 24 shots, he scored 3 goals, then the expected number of scored goals if he shots 56 shots is
- (a) 7 (b) 14 (c) 21 (d) 28
- 21)** In the given figure:
If a person aimed at the given board,
what is the probability of hitting the colored area?
- (a) $\frac{1}{8}$ (b) $\frac{1}{4}$ (c) $\frac{3}{8}$ (d) $\frac{1}{2}$
- 22)** In the given figure: If a shooter hit the board,
what is the probability of hitting the colored part?
- (a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{1}{4}$ (d) $\frac{1}{5}$

Q3 Answer the following :-

1) A random sample of 40 people was taken from the visitors of a public library, it was found that 28 of them prefer scientific books (S), 24 prefer literary books (A), and 16 prefer both types.

(1) Complete the Venn diagram.



(2) If one of the library visitors is chosen randomly,

find each of the following probabilities:

- a) To be among those who prefer scientific books.
- b) To be among those who prefer literary books.
- c) To be among those who prefer only scientific books.
- d) To be among those who prefer only literary books.
- e) To be among those who do not prefer either of the two types.
- f) To prefer at least one of the two types.

(3) If the number of visitors to the library during a week is 3200 people, what is the expected number of those who prefer both types together?

2) A class has 36 students, 27 students passed in Mathematics, 12 students passed in Arabic, 9 students passed in both exams. If a student was chosen randomly

(1) Find the probability that the chosen student:

- a) passed in Mathematics
- b) passed in Arabic
- c) failed in Arabic
- d) failed in both Mathematics and Arabic

(2) If the total number of the school is 540 students, what is the expected number of students passing in Mathematics only?

Answers

Unit 1

Q1 Choose the correct answer :-

1) If $x, 3, 4, 6$ are proportional, what is the value of x ?

- a) 0 b) 1 c) 2 d) 3

2) What is the second proportional for the numbers 4, 6, 12 ?

- a) 18 b) 8 c) 6 d) 2

3) If $7x = 3y$, what is the value of $\frac{y}{x}$?

- a) $\frac{3}{7}$ b) $\frac{3}{10}$ c) $\frac{10}{3}$ d) $\frac{3}{7}$

4) If $2x = 7y$, what is the value of $\left(\frac{x}{y}\right)^{-1}$?

- a) $\frac{7}{2}$ b) $\frac{7}{2}$ c) $\frac{49}{4}$ d) $\frac{4}{49}$

5) If $5x - 3y = 0$, what is the value of $\frac{x}{y}$?

- a) $\frac{5}{3}$ b) $\frac{3}{5}$ c) $-\frac{3}{5}$ d) $-\frac{5}{3}$

6) If $5a, 2, 3b, 7$ are four proportional quantities. What is the value of: $\frac{a}{b}$?

- a) $\frac{3}{7}$ b) $\frac{6}{35}$ c) $\frac{3}{5}$ d) $\frac{3}{2}$

7) If $\frac{a}{5} = \frac{b}{3}$, what is the value of: $\frac{a+b}{a-b}$?

- a) $\frac{8}{3}$ b) $\frac{5}{3}$ c) $\frac{1}{4}$ d) 4

8) If $\frac{a}{3} = \frac{b}{4}$, what is the value of: $\frac{3a-b}{b-a}$?

- a) $\frac{4}{3}$ b) $\frac{3}{4}$ c) $\frac{1}{5}$ d) 5

9) If $\frac{a}{3} = \frac{b}{2}$, what is the value of $(6a - 9b - 1)^{2026}$?

- a) 2026 b) -2026 c) 1 d) -1

10) If $\frac{a}{3} = \frac{b}{5}$, $5a - 2b = 20$, what is the value of: b ?

- a) 3 b) 5 c) 15 d) 20

11) If $\frac{3a}{5b} = \frac{1}{2}$, what is the value of: $\frac{a}{b}$?

a) $\frac{6}{5}$

b) $\frac{5}{6}$

c) $\frac{2}{3}$

d) $\frac{3}{2}$

12) If $4x^2 = 9y^2$, what is the value of: $\frac{x}{y}$?

a) $\frac{9}{4}$

b) $\frac{3}{2}$

c) $\pm \frac{2}{3}$

d) $\pm \frac{3}{2}$

13) If $\frac{5a-7b}{2a+3b} = 0$, what is the value of: $\frac{b}{a}$?

a) $\frac{5}{7}$

b) $\frac{7}{5}$

c) $\frac{3}{10}$

d) $\frac{10}{3}$

14) If $\frac{a+2b}{a-b} = \frac{2}{3}$, what is the value of: $\frac{b}{a}$?

a) $\frac{1}{8}$

b) 8

c) $-\frac{1}{8}$

d) -8

15) If $4x^2 + 9y^2 = 12xy$, what is the value of: $\frac{x}{y}$?

a) $\frac{2}{3}$

b) $\frac{3}{2}$

c) $-\frac{2}{3}$

d) $-\frac{3}{2}$

16) If $3a = 6$ $b = 8c$, then $a : b : c$ equals

a) 3 : 4 : 8

b) 3 : 6 : 8

c) 8 : 4 : 3

d) 8 : 6 : 3

17) If $\frac{x}{6} = \frac{y}{10}$, what is the value of $\frac{x}{y}$?

a) $\frac{5}{3}$

b) $\frac{5}{6}$

c) $\frac{3}{5}$

d) $\frac{5}{10}$

18) If $a, b, 2, 3$ are proportional, what is the value $\frac{b}{a}$?

a) $\frac{3}{2}$

b) $\frac{2}{3}$

c) 3

d) 2

19) If $\frac{a}{b} = \frac{2}{7}$, what is the value of $\frac{2b}{7a}$?

a) $\frac{4}{49}$

b) $\frac{2}{7}$

c) 1

d) $\frac{49}{4}$

20) If $a, x, b, 2x$ are proportional, what is the value $\frac{a}{b}$?

a) 2

b) $\frac{1}{2}$

c) $\frac{1}{3}$

d) $\frac{1}{4}$

21) If a, b, c, d are proportional quantities, then:

a) $\frac{b}{d} = \frac{a}{c}$ b) $\frac{a}{c} = \frac{d}{b}$ c) $\frac{b}{c} = \frac{a}{d}$ d) $ab = cd$

22) If $\frac{5}{x} = \frac{6}{y}$, what is the value of $\frac{2x+y}{y-x}$?

a) 5 b) $\frac{11}{16}$ c) $\frac{16}{11}$ d) 16

23) If $\frac{a}{b} = \frac{c}{d} = \frac{2}{3}$, then $\frac{a+c}{b+d}$ equals

a) $\frac{4}{3}$ b) $\frac{2}{3}$ c) $\frac{4}{9}$ d) $\frac{1}{3}$

24) If $\frac{a}{2} = \frac{b}{3} = \frac{c}{5}$, then each ratio equals:

a) $\frac{a+b+c}{3}$ b) $\frac{a+2b-c}{3}$ c) $\frac{a-b+c}{10}$ d) $\frac{a-b}{5}$

25) If $\frac{4}{x} = \frac{7}{y} = \frac{a}{y-x}$, what is the value of a ?

a) -3 b) 3 c) 11 d) 28

26) If $m - n = 6$, $\frac{3}{m} = \frac{5}{n}$, then what is the value of m ?

a) 15 b) 9 c) -9 d) -15

27) If $\frac{x}{5} = \frac{y}{a} = \frac{3x-2y}{9}$, what is the value of a ?

a) 6 b) 2 c) 3 d) 9

28) What is the mean proportional between a, c ?

a) $\sqrt{a+c}$ b) $\frac{a+c}{2}$ c) $\pm\sqrt{ac}$ d) ac

29) Which of the following numbers are proportional?

a) 2, 4, 6 b) 3, 5, 8 c) 3, 9, 27 d) 1, 4, 9

30) If a is the first proportional for the two numbers 4, 16, what is the value of a ?

a) 8 b) 4 c) 2 d) 1

31) If b is a mean proportional between 3, 12, what is the value of b ?

a) ± 4 b) ± 6 c) ± 9 d) ± 36

- 32) If 6 is the mean proportional between the two numbers $m, 2$, what is the value of m ?
- a) 8 b) 12 c) 18 d) 36
- 33) If x is the positive mean proportional between 24 , 54 , what is the value of x ?
- a) 15 b) 36 c) 39 d) 78
- 34) If $2b$ is a mean proportional between a , $5c$, what is the value of: $\frac{b^2}{ac}$?
- a) 1 b) $\frac{2}{5}$ c) $\frac{3}{5}$ d) 10
- 35) If x, y, z are in continued proportion, What is the value of x ?
- a) $\pm\sqrt{yz}$ b) yz c) $\frac{y^2}{z}$ d) $\frac{y}{z}$
- 36) What is the third proportional for the numbers $x^3, 2x^2$?
- a) $2x$ b) $4x$ c) x^2 d) $2x^5$
- 37) If $7, x, \frac{1}{y}$ are in proportion, What is the value of: x^2y ?
- a) 7 b) $\frac{1}{7}$ c) 14 d) 49
- 38) If b is a mean proportional between $(12 - \sqrt{32}), (3 + \sqrt{2})$, what is the value of b ?
- a) $\pm\sqrt{7}$ b) $\pm 2\sqrt{7}$ c) $\pm 4\sqrt{7}$ d) $\pm 16\sqrt{7}$
- 39) If $\frac{a}{b} = \frac{b}{c} = 3$, then which of the following is correct?
- a) $a = 3c$ b) $a = 9b$ c) $a = 9c$ d) $a = 6c$
- 40) If $\frac{a}{b} = \frac{b}{c} = \frac{c}{5} = 2$, what is the value of a ?
- a) 5×2^2 b) 40 c) 10 d) 2×5^3
- 41) If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 2$,what is the value of $\frac{a}{d}$?
- a) 2 b) 4 c) 8 d) 16



42) The mean proportional between $(x - 2)$, $(x + 2)$ is :

a) $\sqrt{x+2}$

b) $x^2 - 4$

c) $+\sqrt{x^2 - 4}$

d) $\sqrt{x^2 - 4}$

43) If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 3$, then what is the value of : $\frac{a+b+c}{b+c+d}$?

a) 1

b) 3

c) 9

d) 6

44) If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 4$, then what is the value of $\frac{a+d}{d}$?

a) 65

b) 49

c) 37

d) 25

Q2 Answer the following :-

1) If $y : x = 2 : 5$, find the value of $(10x + 3y) : (5x + 2y)$.

$$\frac{56}{29}$$



2) If $(2x-3) : (x-5) = 1 : 4$ find the value of X.

$$= 1$$

3) If $4x^2 + 9y^2 = 12xy$, find the value of $\frac{x}{y}$.

$$\frac{3}{2}$$

4) Find the number if its square is added to both terms of the ratio $7 : 11$ it becomes $4 : 5$

$$3 \text{ or } -3$$

5) If $\frac{x}{2} = \frac{y}{4} = \frac{z}{5}$, $x + y - 2z = 12$, find the value of z.

$$-15$$



6) If a, b, c, d are proportional, prove that $\frac{a+b}{b} = \frac{c+d}{d}$

$$\frac{a}{b} = \frac{c}{d} = k, \quad a = bk \quad c = dk$$

$$\frac{a+b}{b} = \frac{bk+b}{b} = \frac{b(k+1)}{b} = k+1 \quad 1$$

$$\frac{c+d}{d} = \frac{dk+d}{d} = \frac{d(k+1)}{d} = k+1 \quad 2$$

from 1 and 2 $\frac{a+b}{b} = \frac{c+d}{d}$

7) If b is the middle between a, c prove that $\frac{a-c}{a+b} = \frac{a-2b+c}{a-b}$

$$a = ck^2, \quad b = ck$$

$$\frac{a-c}{a+b} = \frac{ck^2-c}{ck^2+ck} = \frac{c(k^2-1)}{ck(k+1)} = \frac{c(k-1)(k+1)}{ck(k+1)} = \frac{(k-1)}{k} \quad 1$$

$$\frac{a-2b+c}{a-b} = \frac{ck^2-2ck+c}{ck^2-ck} = \frac{c(k^2-2k+1)}{ck(k-1)} = \frac{c(k-1)(k-1)}{ck(k-1)} = \frac{(k-1)}{k} \quad 2$$

from 1 and 2 $\frac{a-c}{a+b} = \frac{a-2b+c}{a-b}$

8) Find the value of x, y if $x, 12, 6, y$ in continued proportion

$$x = 24 \quad y = 3$$

9) If b is the middle between a, c prove that $\frac{4a^2-9b^2}{4b^2-9c^2} = \frac{a}{c}$

$$a = ck^2, \quad b = ck$$

$$\frac{4a^2-9b^2}{4b^2-9c^2} = \frac{4c^2k^4-9c^2k^2}{4c^2k^2-9c^2} = \frac{c^2k^2(4k^2-9)}{c^2(4k^2-9)} = k^2 \quad 1$$

$$\frac{a}{c} = \frac{ck^2}{c} = k^2 \quad 2$$

from 1 and 2 $\frac{4a^2-9b^2}{4b^2-9c^2} = \frac{a}{c}$



10) Find the value of x , y if 2 , x , y , 54 in continued proportion

$$X = 6 \quad y = 18$$

11) Find the value of x if x , 24 , 144 are proportional

$$X = 4$$

12) If $\frac{a}{4x+y} = \frac{b}{x-4y}$ prove that $\frac{a+b}{5x-3y} = \frac{a-b}{3x+5y}$

Prove by yourself or watch the video on YouTube

13) If $\frac{a}{2x-y} = \frac{b}{2y-x}$ prove that $\frac{2a+b}{a+2b} = \frac{x}{y}$

Prove by yourself or watch the video on YouTube

14) If $\frac{x}{a-b+c} = \frac{y}{b-c+a} = \frac{z}{c-a+b}$ prove that $\frac{x+y}{a} = \frac{y+z}{b}$

Prove by yourself or watch the video on YouTube

15) If $\frac{a}{2} = \frac{b}{3} = \frac{c}{4} = \frac{2a-b+5c}{3x}$ find the value of x .

$$x = 7$$

Unit 2

Q1 Choose the correct answer :-

1) If $(x - 1, 11) = (8, y + 3)$, then $\sqrt{x + 2y} = \dots\dots\dots$

a) 5

b) ± 5 c) $\sqrt{17}$

d) 25

2) If $(3^x, \sqrt{y}) = (1, 4)$, then $x + y = \dots\dots\dots$

a) 2

b) 3

c) 16

d) 17

3) If $x > y$, $(x^3, y^2) = (1, 4)$, then $xy = \dots\dots\dots$

a) 4

b) 2

c) -2

d) -4

4) If $(x - 3, y) = (2, \sqrt{16})$, then $(y, x) = \dots\dots\dots$

a) (1, 4)

b) (5, 4)

c) (4, 1)

d) (4, 5)

5) If $X = \{1, 2\}$, then $X \times \emptyset = \dots\dots\dots$

a) X

b) $\emptyset$ c) $\{0\}$ d) $\{(1, 0), (2, 0)\}$

6) $\{3\} \times \{5\} = \dots\dots\dots$

a) {15}

b) {3, 5}

c) (3, 5)

d) {(3, 5)}

7) If $X = \{3, 5\}$, $Y = \{6, 7\}$, then $(6, 7) \in \dots\dots\dots$

a) $X \times Y$ b) $Y \times X$ c) X^2 d) Y^2

8) If $X = \{3\}$, then $X^2 = \dots\dots\dots$

a) 9

b) (3, 3)

c) {9}

d) {(3, 3)}

9) If $X = \{3\}$, then $n(X^2) = \dots\dots\dots$

a) 1

b) 9

c) {3, 3}

d) 3

10) If $n(X) = 3$, $n(X \times Y) = 12$, then $n(Y) = \dots\dots\dots$

a) 4

b) 9

c) 15

d) 36

11) If $n(X^2) = 9$, then $n(X) = \dots\dots\dots$

a) 2

b) 3

c) 9

d) 81

12) If $X = \{5, 7, 9\}$ and $n(X \times Y) = 6$, then $n(Y^2) = \dots\dots\dots$

- a) 4 b) 6 c) 9 d) 12

13) If $X \times Y = \{(1, 4), (1, 7), (1, 8)\}$, then $n(Y^2) = \dots\dots\dots$

- a) 1 b) 3 c) 6 d) 9

14) If $X = \{2, 3, 4, 7, 8\}$, $Y = \{1, 4, 5, 6\}$, then $n(X^2) - n(Y \times X) = \dots\dots\dots$

- a) 5 b) 10 c) 15 d) 25

15) If $n(X^2) = 9$, $n(X \times Y) = 12$, then $n(Y^2) = \dots\dots\dots$

- a) 4 b) 6 c) 9 d) 16

16) If X is a non-empty set $n(X) = n(X \times Y)$, then $n(Y) = \dots\dots\dots$

- a) 1 b) 2 c) 3 d) 4

17) If X, Y are two sets where: $n(X \times Y) = 11$, then $n(X) + n(Y) = \dots\dots\dots$

- a) 8 b) 9 c) 11 d) 12

18) If X, Y are two sets where: $n(X^2) + n(X \times Y) = 5$, then $n(Y^2) = \dots\dots\dots$

- a) 25 b) 16 c) 4 d) 1

19) To which cartesian product from the following, the point $\left(\frac{1}{2}, \sqrt{5}\right)$ belongs to?

- a) $\mathbb{N} \times \mathbb{N}$ b) $\mathbb{Z} \times \mathbb{Z}$ c) $\mathbb{Q} \times \mathbb{Q}$ d) $\mathbb{R} \times \mathbb{R}$

20) Which of the following ordered pairs belongs to $\mathbb{Q} \times \mathbb{Q}$?

- a) $(\sqrt[3]{1}, \sqrt{2})$ b) $(-\sqrt[3]{16}, -5)$ c) $\left(\sqrt{\frac{4}{9}}, -\frac{1}{2}\right)$ d) $\left(\sqrt[3]{27}, -\sqrt{\frac{1}{8}}\right)$

21) If the function $f: X \rightarrow Y$, then the range of the function f is a subset of

- a) $X \times Y$ b) X c) $Y \times X$ d) Y

22) If $f(x) = x^2 - x + 3$, what is the value of $f(-2)$?

- a) -2 b) -1 c) 5 d) 9

23) If $f(x) = x^2 - \sqrt{2}x$, what is the value of $f(\sqrt{2})$?

a) 4

b) 2

c) 6

d) 0

24) If the function $f: \mathbb{Z} \rightarrow \mathbb{Z}$ where $f(x) = x^2$, then $f(2) + f(-2) = \dots\dots\dots$

a) 0

b) 4

c) 8

d) -8

25) If $f(x) = x^2$, $g(x) = x + 4$, What is the value of : $5f(2) + 2g(5)$?

a) 18

b) 20

c) 38

d) 70

26) If $f(x) = kx + 8$, $f(2) = 0$, What is the value of k ?

a) 8

b) 6

c) 4

d) -4

27) If $f(x) = x - 5$, and $\frac{1}{2}f(a) = 3$, What is the value of a ?

a) 2

b) 8

c) 11

d) 16

28) If $(-1, 0)$ belongs to the function f where $f(x) = mx + 2$, What is the value of m ?

a) 0

b) -1

c) 2

d) -2

29) If $(3, y)$ belongs to the function f where $f(x) = x + 2$, what is the value of y ?

a) 5

b) 3

c) 2

d) 1

30) If (a, a) belongs to the function f where $f(x) = 2x + 3$, what is the value of a ?

a) 2

b) 3

c) -3

d) -2

31) If $X = \{2, 4, 6\}$, $n(Y) = 4$ and the function $f: X \rightarrow Y$, $f(x) = x^2 - 1$, then Y can be

a) $\{3, 7, 13\}$ b) $\{3, 15, 25, 45\}$ c) $\{3, 15, 35\}$ d) $\{3, 15, 25, 35\}$

32) The straight line representing the function f where $f(x) = 3x - 12$ cuts the x -axis at the point

a) $(-12, 0)$ b) $(12, 0)$ c) $(4, 0)$ d) $(-4, 0)$

33) The straight line representing the function f where $f(x) = 6 - 2x$ cuts the y -axis at the point

- a) $(0, -6)$ b) $(0, -3)$ c) $(0, 3)$ d) $(0, 6)$

34) The ordered pair $(1, 2)$ belongs to the function f where:

- a) $f(x) = 2x - 1$ b) $f(x) = -3x + 7$
c) $f(x) = 2x + 1$ d) $f(x) = -3x + 5$

35) If $f(x) = 7$, then $f(-3) = \dots\dots\dots$

- a) 7 b) -7 c) 21 d) -21

36) If $f(x) = 2$, then $3f(\sqrt{2}) = \dots\dots\dots$

- a) $f(3\sqrt{2})$ b) $3\sqrt{2}$ c) 6 d) $2\sqrt{3}$

37) If $f(x) = 2$, then $f(3) - f(1) = \dots\dots\dots$

- a) $f(2)$ b) 2 c) 0 d) 4

38) If $f: \mathbb{R} \rightarrow \mathbb{R}$ and $f(x) = 3$, then $\frac{f(6)}{f(0)} = \dots\dots\dots$

- a) 6 b) 1 c) 3 d) undefined

39) If $f: \mathbb{R} \rightarrow \mathbb{R}$ and $f(x) = 7$, what is the value of $\frac{5f(4)}{10f(6)}$?

- a) $\frac{1}{3}$ b) $\frac{1}{2}$ c) $\frac{7}{3}$ d) $\frac{7}{2}$

40) The function $f: \mathbb{R} \rightarrow \mathbb{R}$ where $f(x) = 5$ is represented by a straight line that intersects the y-axis at the point $\dots\dots\dots$

- a) $(5, 0)$ b) $(0, 5)$ c) $(-5, 0)$ d) $(0, -5)$

41) If the straight line representing the function f where $f(x) = 2x - a$ passes through the origin, then $a = \dots\dots\dots$

- a) -2 b) 2 c) 0 d) 3

- 42) If the straight line representing the function f where $f(x) = kx + 4$ passes through the point $(1, 1)$, what is the value of $f(-1)$?
a) -7 b) -1 c) 1 d) 7
- 43) If the straight line representing the function f where $f(x) = 2x + b$ passes through the point $(-1, 5)$, what is the value of $f(0)$?
a) -7 b) -5 c) 5 d) 7
- 44) If the point $(k, 5)$ lies on the straight line representing the function f where $f(x) = 2x - 7$, what is the value of k ?
a) 3 b) 4 c) 5 d) 6
- 45) If $(5k, k)$ belongs to the function f where $f(x) = 3x + 14$, what is the value of k ?
a) 14 b) 10 c) -7 d) -1
- 46) If $g(x) = 4$, $f(x) = -3$, what is the perpendicular distance between the two straight lines representing the two functions f, g ?
a) 1 b) 3 c) 5 d) 7
- 47) Which of the following equations is an equation of the first degree in one variable?
a) $x + y = 12$ b) $2x - \frac{2}{x} = 0$ c) $2\sqrt{x} + 3 = 5$ d) $2x - 4 = 3$
- 48) The solution set of the equation: $5x - 7 = 2x + 5$ in $\mathbb{R}$ is
a) $\{4\}$ b) $\{3\}$ c) $\{5\}$ d) $\{2\}$
- 49) What is the solution set of the equation: $\sqrt{2}x - 1 = 1$ in $\mathbb{R}$?
a) $\{2\}$ b) $\{1\}$ c) $\{\sqrt{2}\}$ d) $\emptyset$
- 50) The solution set of the equation: $\frac{y+2}{3} = \frac{y-1}{2}$ in $\mathbb{R}$ is

- a) $\{-5\}$ b) $\{7\}$ c) $\{-7\}$ d) $\{5\}$

51) Which of the following inequalities is an inequality of the first degree in one variable?

- a) $x^2 - x \geq 3$ b) $0.4t - 7 < 2t$ c) $\frac{2}{t} + t > 5$ d) $3x < 2y + 5$

52) Which of the following inequalities expresses the solution set in $\mathbb{R}$ represented by the given figure?



- a) $x > 3$ b) $x < 3$ c) $x \geq 3$ d) $x \leq 3$

53) Which of the following inequalities expressed by the given figure?



- a) $-4 < x < 4$ b) $-4 \leq x < 4$ c) $-4 < x \leq 4$ d) $-4 \leq x \leq 4$

54) What is the solution set of the inequality $2x < 14$ in $\mathbb{R}$?

- a) $] -\infty, 7[$ b) $] -7, \infty[$ c) $] 7, \infty[$ d) $[7, \infty[$

55) What is the solution set of the inequality $3 \geq x > -2$ in $\mathbb{R}$?

- a) $[-2, 3]$ b) $[-2, 3[$ c) $[-2, 3]$ d) $] -2, 3[$

56) What is the solution set of the inequality $-x > 3$ in $\mathbb{R}$?

- a) $] -\infty, -3[$ b) $] -\infty, 3[$ c) $] -3, \infty[$ d) $] 3, \infty[$

57) What is the solution set of the inequality $5 > -x > -3$ in $\mathbb{R}$?

- a) $[-5, 3]$ b) $] -5, 3[$ c) $[-3, 5]$ d) $] -3, 5[$

58) The solution set of the inequality $-1 < x - 5 < 1$ in $\mathbb{R}$ is

- a) $[4, 6]$ b) $] 4, 6[$ c) $] 4, 6]$ d) $[4, 6[$

59) The interval $[-1, 2[$ is the solution set in $\mathbb{R}$ for the inequality

- a) $-1 < x < 2$ b) $-1 < x < 2$ c) $-1 \leq x < 2$ d) $-1 \leq x \leq 2$

60) If $-2 < 2x < 6$, then $x \in$

- a) $] -1, 3[$ b) $] -1, 3]$ c) $[-1, 3[$ d) $[-1, 3]$

61) If $3 > x > -3$ where $x \in \mathbb{R}$, then $2x$ belongs to

- a) $] -5, 5[$ b) $[-6, 6]$ c) $] -6, 6]$ d) $] -6, 6[$

62) If $2 > x > -2$ where $x \in \mathbb{R}$, then $2x + 3$ belongs to

- a) $[-1, 7]$ b) $] -1, 5[$ c) $] -1, 7[$ d) $] -4, 6[$

63) The number 5 belongs to the solution set of the inequality

- a) $x > 5$ b) $x < 5$ c) $-x \geq -5$ d) $-x \geq 5$

Q2 Answer the following :-**1) Using the opposite venn diagram find :**

a) $(A \cap C) \times B$

$\{(2, 1), (2, 5), (2, 7)\}$

b) $(C \cup B) \times B$

$\{(1, 1), (1, 5), (1, 7), (2, 1), (2, 5), (2, 7), (3, 1), (3, 5), (3, 7), (5, 1), (5, 5), (5, 7), (7, 1), (7, 5), (7, 7)\}$

2) If $A = \{1, 7, 9\}$, $B = \{2, 4, 7\}$, $C = \{1, 7\}$, find :**a) $A \times C$ and represent it by arrow diagram**

$\{(1, 1), (1, 7), (7, 1), (7, 7), (9, 1), (9, 7)\}$

b) $B \times (A \cup C)$

$\{(4, 1), (4, 7), (4, 9), (2, 1), (2, 7), (2, 9), (7, 1), (7, 7), (7, 9)\}$

3) If $X = \{1, 3, 5\}$, $Y = \{1, 2, 4, 5, 6\}$ and $\mathbb{R}$ is a relation from X to Y , where $a\mathbb{R}b$ means $a+b=7$, for each $a \in X$, $b \in Y$ **a) Write the relation $\mathbb{R}$ as a set of ordered pairs**

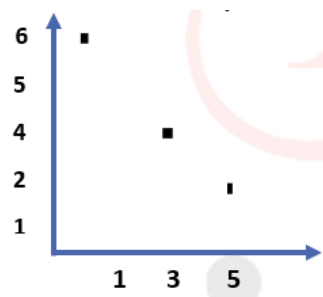
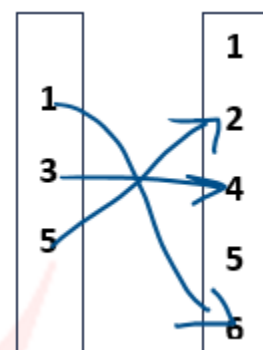
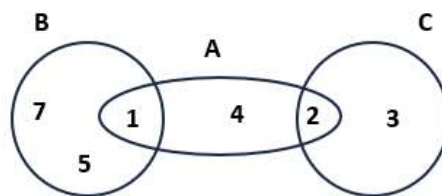
$\mathbb{R} = \{(1, 6), (3, 4), (5, 2)\}$

b) Write the relation $\mathbb{R}$ in a table

X	1	3	5
Y	6	4	2

c) Represent the relation by an arrow diagram**d) Represent the relation by a cartesian diagram****e) Find its domain and range**

domain = $\{1, 3, 5\}$ range = $\{2, 4, 6\}$



4) If $f(X) = 3X + b$, $f(4) = 15$, find the value of $5b^2 + 2b - 20$

= 31

5) If $X = \{4, 3, 2\}$, and $\mathbb{R}$ is a relation from X to X , which $a\mathbb{R}b$ means $b+a=\text{even number}$, $a \in X$, $b \in Y$

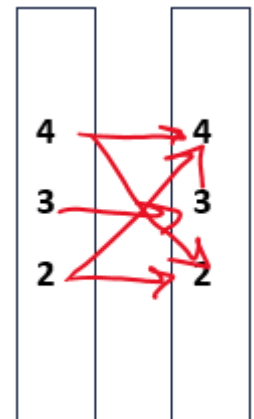
a) Write the relation $\mathbb{R}$ as a set of ordered pairs

$$\mathbb{R} = \{(4, 4), (4, 2), (2, 2), (2, 4), (3, 3)\}$$

b) Write the relation $\mathbb{R}$ in a table

X	2	2	3	4	4
Y	2	4	3	2	4

c) Represent the relation by an arrow diagram

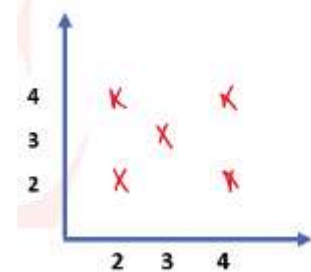


d) Represent the relation by a cartesian diagram

e) Is the relation is a function ? why ?

No, because the elements 4 and 2 $\in X$ appear as

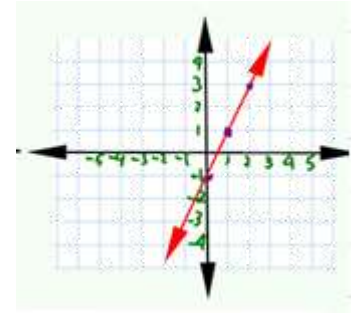
A first projection more than one time



6) Represent the following graphically :

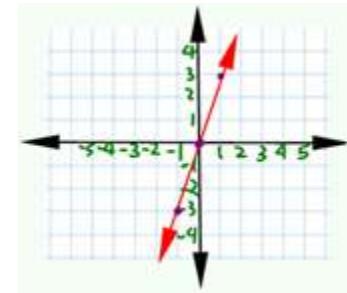
1) $f(X) = 2X - 1$

x	0	1	2
$f(x)$	-1	1	3



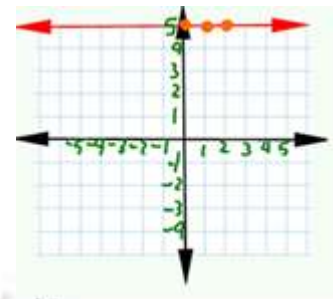
2) $f(X) = 3X$

x	0	1	-1
$f(x)$	0	3	-3



3) $f(X) = 5$

x	0	1	2
$f(x)$	5	5	5



7) If $f(x) = 2x + k$, the point (3 , 11) lies on the straight line which represent the function f , find the value of $f(2)$, k

$k=5$ $f(2)=9$

8) If $f(x) = 2x + b$, the point (3 , 10) lies on the straight line which represent the function f , find the value of $f(5)$, b

$b = 4$ $f(5) = 14$

9) Find the solution set in $\mathbb{R}$ of the equation $2x - \sqrt{2} = 5\sqrt{2}$

$S.S = \{3\sqrt{2}\}$

10) Find the solution set in $\mathbb{R}$ of the equation $4(x + 5) + 3 = 2x + 11$

$S.S = \{-6\}$

11) Find the solution set in $\mathbb{R}$ of the equation $6x - 5 = 2x + 11$

$S.S = \{4\}$

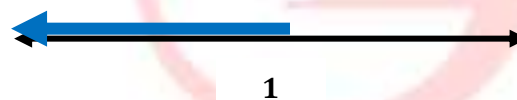
12) Use the inequality to express the set of real numbers greater than 5 and less than 8 then represent on the number line

$5 < x < 8$



13) Find the solution set of the following inequality in $\mathbb{R}$ and represent it on the number line $5 - 3x \geq 2$

$S.S =]-\infty, 1]$



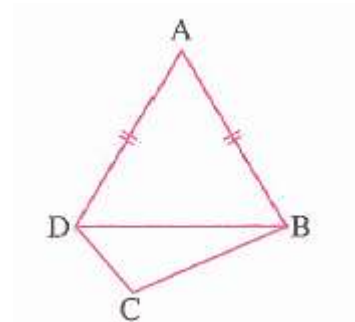
14) If $f(X) = 5X + b$, $f(2) = 12$, find the value of $b^2 - 2b - 10$

$= -10$

Unit 3

Q1 Choose the correct answer :-

- 1) The sum of the lengths of any two sides in a triangle the length of the third side.
 a) is less than b) **is greater than** c) is equal to d) half
- 2) The length of any side in a triangle the sum of the lengths of the other two sides.
 a) $>$ b) $<$ c) $=$ d) is double
- 3) If the lengths of two sides in a triangle are 7 cm and 4 cm then the length of the third could be
 a) 1 cm b) 2 cm c) 3 cm d) **4 cm**
- 4) In $\triangle ABC$, if $AB = 3$ cm, $BC = 5$ cm, and $AC = x$ cm, then : $x \in$
 a) $]3, 5[$ b) $]2, 5[$ c) $]5, 8[$ d) **$]2, 8[$**
- 5) In $\triangle ABC$, $AB + BC - AC$
 a) **$> \text{zero}$** b) $< \text{zero}$
 c) $= \text{zero}$ d) = the perimeter of $\triangle ABC$
- 6) In the given figure:
 Which of the following statements is true?
 a) $AB < CD$ b) $AC < BD$ c) **$AC > BD$** d) $AC = BD$
- 7) In the given figure:
 $m(\angle DBC) < m(\angle BDC)$, $AB = AD$
 then: $m(\angle ABC)$ $m(\angle ADC)$
 a) **$<$** b) $>$
 c) $=$ d) $\geq$



8) If $AB = 7$ cm, $BC = 5$ cm, $AC = 6$ cm, then the smallest angle in measure is

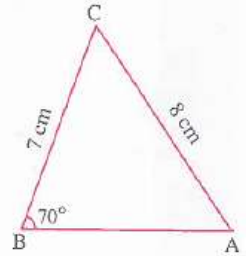
- a) $\angle A$ b) $\angle B$ c) $\angle C$ d) $\angle ABC$

9) In $\triangle EFG$: If $FG > EF$, then $m(\angle E) > \dots\dots\dots$

- a) 90° b) $m(\angle GEF)$ c) $m(\angle F)$ d) $m(\angle G)$

10) In the given figure: $m(\angle A)$ could be equal

- a) 70° b) 80°
c) 60° d) 75°

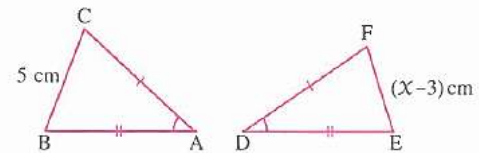


11) If ABC is a triangle in which: $m(\angle B) = 90^\circ$ then:

- a) $BC < AC$ b) $AC < AB$ c) $AC < BC$ d) $AC = AB$

12) In the given figure: If $m(\angle A) > m(\angle D)$, What is the possible value of from the following values?

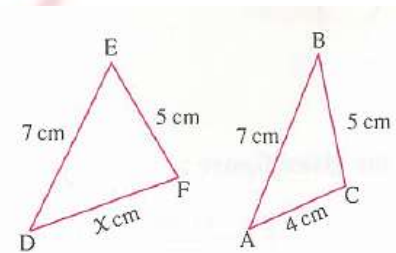
- a) 2 b) 3
c) 7 d) 9



13) In the given figure:

If $m(\angle E) > m(\angle B)$, what is the inequality that expresses the possible values of x ?

- a) $2 < x < 12$ b) $4 < x < 12$
c) $4 < x < 16$ d) $x > 12$



14) The projection of a point on given a straight line is

- a) a point. b) a line segment.
c) a ray. d) straight line.

15) The projection of a line segment on a straight line that is not perpendicular to it is

- a) a ray. b) a point.
c) a line segment. d) a straight line.

16) The length of the projection of a line segment on a given straight line is the length of the line segment itself.

- a) $\leq$ b) $>$ c) $\geq$ d) $=$

17) The length of the projection of a line segment on a given perpendicular straight line

- a) is greater than the length of the original segment.
b) equals the length of the original segment.
c) is greater than or equal to the length of the original segment.
d) equals zero.

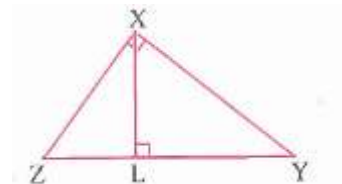
18) If $\overline{XY} \parallel \overline{AB}$, then the length of the projection of $\overline{AB}$ on $\overline{XY}$ the length of $\overline{AB}$

- a) $>$ b) $<$ c) $=$ d) $\geq$

19) In the given figure:

$$LZ \times YL = \dots\dots\dots$$

- a) $(XL)^2$ b) $(XY)^2$
c) $(XZ)^2$ d) $(YZ)^2$



20) The circumference of the circle =

- a) $2\pi r$ b) πr c) $4\pi r$ d) $2\pi d$

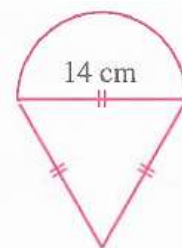
21) What is the circumference of a circle with a radius length of 20 cm ?

- a) 10π cm b) 20π cm c) 40π cm d) 80π cm

22) What is the area of the circle whose radius length is 10 m ?

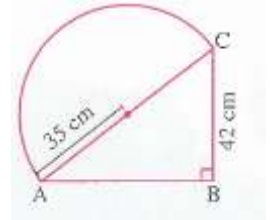
- a) 5π m² b) 10π m² c) 25π m² d) 100π m²

- 23) What is the area of a circle whose diameter length is 1.4 cm? ($\pi \approx \frac{22}{7}$)
a) 1.4 cm² b) 1.08 cm² c) 1.54 cm² d) 6.16 cm²
- 24) In any circle, what is the value of $\frac{C}{d}$?
a) $\frac{\pi}{2}$ b) $\frac{2}{\pi}$ c) π d) 2π
- 25) The radius length of a circle is 1 foot, then its area = square feet.
a) $\frac{1}{2}\pi$ b) π c) 2π d) π^2
- 26) $\pi =$
a) $\frac{C}{r}$ b) $\frac{C}{2r}$ c) $\frac{2C}{r}$ d) $\frac{C}{3r}$
- 27) What is the radius length of a circle whose circumference is 13π cm ?
a) $\frac{\pi}{2}$ cm b) 6.5 cm c) 13 cm d) 26 cm
- 28) What is the diameter length of a circle whose area is 36π square inches?
a) 6 inches b) 12 inches c) 18 inches d) 36 inches
- 29) The area of a circle is 4π cm². What is its circumference?
a) $16\pi^2$ cm b) 16π cm c) 8π cm d) 4π cm
- 30) The circumference of a circle is 10π cm, what is its area?
a) 25π cm² b) 50π cm² c) 75π cm² d) 100π cm²
- 31) The areas of two circles are 64π , 100π , what is the ratio between their circumferences?
a) 3 : 4 b) 4 : 5 c) 9 : 16 d) 16 : 25
- 32) The perimeter of the figure =
a) $14(\pi + 3)$ cm b) $7(\pi + 6)$ cm
c) $14(\pi + 2)$ cm d) $7(\pi + 4)$ cm



33) The perimeter of the figure $\approx$ where ($\pi \approx 3.14$)

- a) 208 cm b) 278 cm
c) 318 cm d) 388 cm



34) The perimeter of the colored part $\approx$ where ($\pi \approx 3.14$)

- a) 11 cm b) 14 cm
c) 25 cm d) 36 cm



35) A right circular cylinder, whose base radius length is r cm and its height is h cm . , what is its volume?

- a) $\frac{1}{2}\pi r^2 h \text{ cm}^3$ b) $\pi r^2 h \text{ cm}^3$ c) $2\pi r^2 h \text{ cm}^3$ d) $\pi r h^2 \text{ cm}^3$

36) A right circular cylinder whose base radius length is r cm and its height is h cm , what is its surface area?

- a) $2\pi rh$ b) $2\pi r^2 h$ c) $2\pi r(h + r)$ d) $2\pi h(h + r)$

37) A right circular cylinder whose base radius length is 5 cm , and its height is 15 cm , what is its surface area?

- a) $75\pi \text{ cm}^2$ b) $200\pi \text{ cm}^2$ c) $250\pi \text{ cm}^2$ d) $375\pi \text{ cm}^2$

38) A right circular cylinder whose base diameter length is 10 cm. and its height is 15 cm. , what is its volume?

- a) $75\pi \text{ cm}^3$ b) $150\pi \text{ cm}^3$ c) $375\pi \text{ cm}^3$ d) $1500\pi \text{ cm}^3$

39) A right circular cylinder whose volume is $320\pi \text{ cm}^3$, and its height is 20 cm . , what is the diameter length of its base?

- a) 2 cm b) 4 cm c) 8 cm d) 16 cm



40) If the lateral area of a right circular cylinder equals $2\pi r^2 \text{ cm}^2$, what is its height?

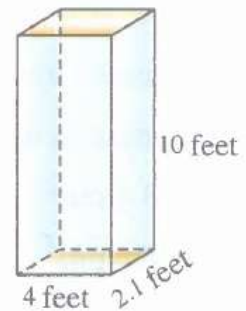
- a) $\frac{1}{2}r \text{ cm}$ b) $\frac{3}{4}r \text{ cm}$ c) $r \text{ cm}$ d) $2r \text{ cm}$

41) A right circular cylinder whose base circumference is $14\pi \text{ cm}$ and its height is 3 cm , what is its volume?

- a) $49\pi \text{ cm}^3$ b) $98\pi \text{ cm}^3$ c) $147\pi \text{ cm}^3$ d) $196\pi \text{ cm}^3$

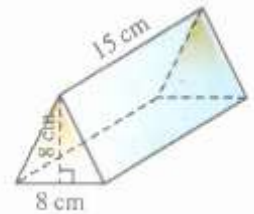
42) What is the volume of the given rectangular prism?

- a) 64 cubic feet. b) 76 cubic feet.
c) 84 cubic feet. d) 122 cubic feet.



43) What is the volume of the given triangular prism?

- a) 160 cm^3 b) 320 cm^3
c) 400 cm^3 b) 480 cm^3



44) A prism with a square base of side length 7 cm and a height of 4 cm , then it has a lateral area of cm^2

- a) 28 b) 56 c) 84 d) 112

45) If the base of a right prism is an equilateral triangle with side length 5 cm . and the height of the prism equals 4 cm , what is the lateral area of the prism?

- a) 15 cm^2 b) 30 cm^2 c) 60 cm^2 d) 240 cm^2



- 46) A right pentagonal prism whose base is a regular pentagon with area 10 m^2 , and the area of one of its lateral rectangles is 9 m^2 . what is the total area of the prism?
- a) 19 m^2 b) 38 m^2 c) 55 m^2 d) 65 m^2
- 47) What is the distance between the point $A(-3,4)$ and the origin point?
- a) 3 units of length. b) 4 units of length.
c) 5 units of length. d) 7 units of length.
- 48) The distance between the point $(\sqrt{3}, 1)$ and the origin point is unit(s) of length.
- a) 4 b) 3 c) 2 d) 1
- 49) If O is the origin point, $A(x, 5)$ and $OA = 13$ units of length, what is the value of x ?
- a) -12 b) 12 c) ± 12 d) 144
- 50) The distance between the two points $(3, a), (-1, a)$ is units of length.
- a) 16 b) 9 c) 5 d) 4
- 51) What is the length of the radius of the circle whose center is $(7, 4)$ and passes through the point $(3, 1)$?
- a) 5 units of length. b) -5 units of length.
c) 2.5 units of length. d) 25 units of length.
- 52) If ABCD is a square, $A(3, 5), B(4, 2)$ what is the area of the square ABCD?
- a) $\sqrt{10}$ square units. b) 10 square units.
c) $4\sqrt{10}$ square units. d) 40 square units.
- 53) What is the distance between the point $(-5, -2)$ and the y – axis ?
- a) -5 units of length. b) -2 units of length.
c) 2 units of length. d) 5 units of length.

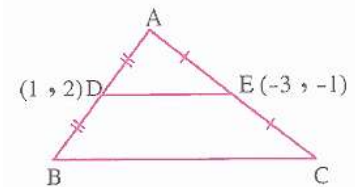
54) What is the distance between the point $(-4, \ell)$ and the x -axis where $\ell \in \mathbb{R}$?

- a) 4 units of length. b) ℓ units of length.
c) -4 units of length. d) $|\ell|$ units of length.

55) In the given figure:

What is the length of $\overline{BC}$?

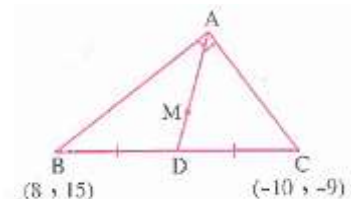
- a) 12 units of length. b) 10 units of length.
c) 8 units of length. d) 5 units of length.



56) In the given figure:

If M is the intersection point of the medians of triangle ABC, what is the length of $\overline{DM}$?

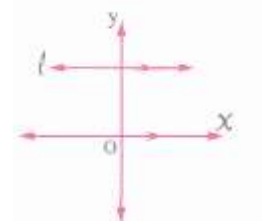
- a) 5 units of length. b) 6 units of length.
c) 7 units of length. d) 8 units of length.



57) In the given figure:

What is the slope of the straight line ℓ ?

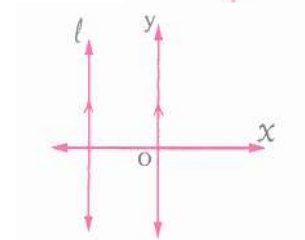
- a) 1 b) -1
c) 0 d) undefined



58) In the given figure:

What is the slope of the straight line ℓ ?

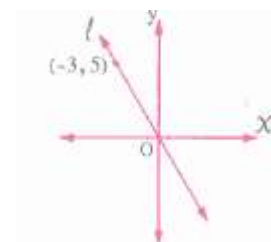
- a) 1 b) -1
c) 0 d) undefined



59) In the given figure:

What is the slope of the straight line ℓ ?

- a) $\frac{5}{3}$ b) $\frac{3}{5}$
c) $-\frac{3}{5}$ d) $-\frac{5}{3}$

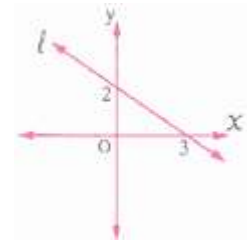


60) In the given figure:

What is the slope of the straight line ℓ ?

a) $\frac{2}{3}$
c) $\frac{3}{2}$

b) $-\frac{2}{3}$
d) $-\frac{3}{2}$



61) What is the slope of the straight line passing through the two points $A(3, 2), B(4, 2)$?

a) 2

b) 1

c) 0

d) undefined

62) If the slope of the straight line passing through the two points $(-4, k), (6, -7)$, equal $-\frac{1}{3}$, what is the value of k ?

a) 23

b) -23

c) $\frac{11}{3}$

d) $-\frac{11}{3}$

63) In the given figure:

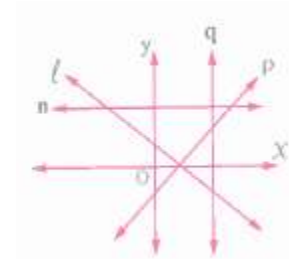
Which of the four straight lines has a negative slope ?

a) ℓ

b) n

c) q

d) p



64) In the given figure:

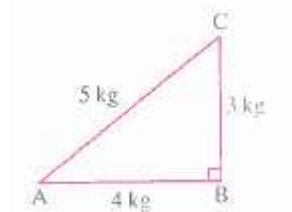
What is the slope of the road $\overrightarrow{AC}$?

a) $\frac{4}{3}$

b) $\frac{3}{4}$

c) $\frac{3}{5}$

d) $\frac{4}{5}$



65) The points in the table lie on a straight line.

What is the slope of the straight line?

a) $-\frac{1}{3}$

b) -3

c) -4

d) 4

x	-3	-2	-1	0
y	5	2	-1	-4



Q2 Answer the following :-**1) In the opposite figure**

if the points A,B,C and D are collinear , $AB < DC$ prove that $DB > AC$

$$\therefore AB < DC$$

By adding BC to both

$$\therefore AB + BC < DC + BC$$

$$\therefore AC < DB$$

**2) In the opposite figure**

$A \in \overrightarrow{DB}$, $m(\angle CAB) = 30^\circ$, $m(\angle EAD) = 80^\circ$

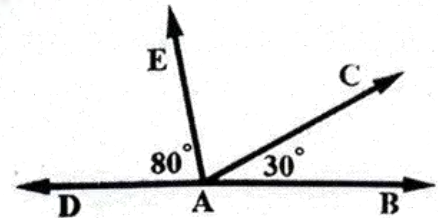
Prove that $m(\angle DAC) > m(\angle BAE)$

$$\therefore A \in \overrightarrow{DB} , m(\angle CAB) < m(\angle EAD)$$

By adding $(\angle EAC)$ to both

$$\therefore m(\angle CAB) + (\angle EAC) < m(\angle EAD) + (\angle EAC)$$

$$\therefore m(\angle DAC) > m(\angle BAE)$$

**3) In the opposite figure**

ABC is triangle in which $AC > AB$, $D \in \overline{AC}$, $E \in \overline{AB}$, such that $m(\angle ADE) = m(\angle AED)$, prove that $DC > EB$

$$\therefore AC > AB \quad 1$$

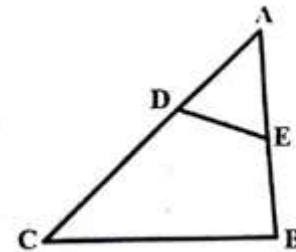
$$\therefore m(\angle ADE) = m(\angle AED)$$

$$\therefore AD = AE \quad 2$$

By subtracting 2 from 1

$$\therefore AC - AD > AB - AE$$

$$\therefore DC > EB$$

**4) In the opposite figure**

$EB > ED$, $EA > EC$, prove that $AB > CD$

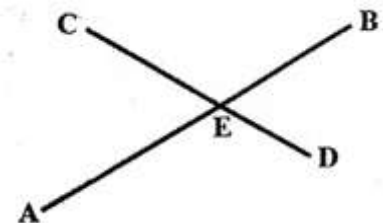
$$\therefore EB > ED \quad 1$$

$$EA > EC \quad 2$$

By adding 1 and 2

$$\therefore EB + EA > ED + EC$$

$$\therefore AB > CD$$



5) In the opposite figure

$C \in \overline{AE}$, $AB = AE$ Prove $m(\angle ABE) > m(\angle C)$

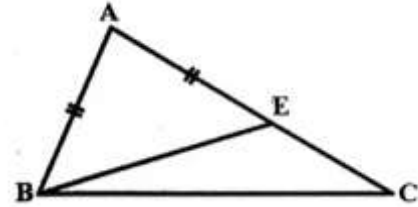
$$\therefore AB = AE$$

$$\therefore m(\angle ABE) = m(\angle AEB)$$

$$\therefore AE + EC > AB$$

$$\therefore AC > AB$$

$$\therefore m(\angle ABE) > m(\angle C)$$



6) ABC is a triangle in which $m(\angle A) = 30^\circ$, $m(\angle B) = 70^\circ$, arrange the side lengths of the triangle in a descending order .

AB , AC , CB

7) ABCD is a quadrilateral in which $AB=7\text{cm}$, $BC=4\text{cm}$, $CD=5\text{cm}$, $AD=8\text{cm}$.
Prove $m(\angle ABC) > m(\angle ADC)$

In triangle ABD:

$$\therefore AD > AB$$

$$m(\angle ABD) > m(\angle ADB) \quad (1)$$

In triangle CBD:

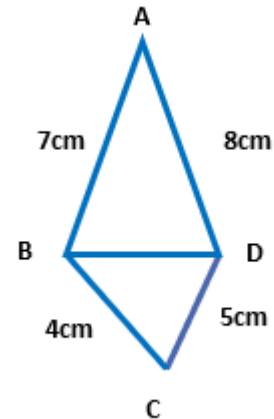
$$\therefore CD > BC$$

$$m(\angle DBC) > m(\angle CDB) \quad (2)$$

By adding (1) and (2):

$$m(\angle ABD) + m(\angle DBC) > m(\angle ADB) + m(\angle CDB)$$

$$\therefore m(\angle ABC) > m(\angle ADC)$$



8) ABC is a triangle in which $D \in \overrightarrow{BC}$, $F \in \overrightarrow{AB}$,
 $m(\angle ACD) = 130^\circ$, $m(\angle FBC) = 100^\circ$,
prove that $AC > AB$

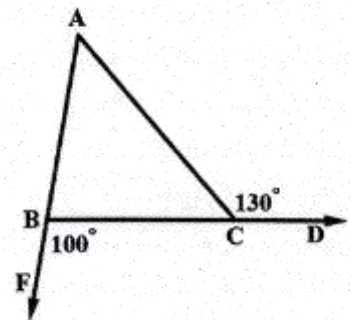
$$\therefore m(\angle ACD) + m(\angle ACB) = 180 \quad (\text{straight angle})$$

$$\therefore m(\angle ACB) = 180 - 130 = 50$$

$$\therefore m(\angle FBC) + m(\angle ABC) = 180 \quad (\text{straight angle})$$

$$\therefore m(\angle ABC) = 180 - 100 = 80$$

$$\therefore m(\angle ABC) > m(\angle ACB) \quad (80 > 50)$$



∴ the side opposite the larger angle is longer:

$$\therefore AC > AB$$

9) In the opposite figure

ABC is a triangle in which $AC > AB$

$\overline{FE} \parallel \overline{BC}$, Prove $m(\angle AFE) > m(\angle AEF)$

$$\therefore AC > AB$$

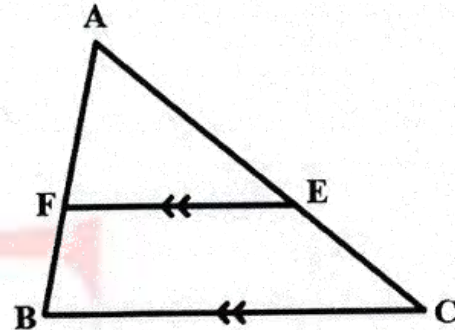
$$\therefore m(\angle ABC) > m(\angle ACB)$$

$$\therefore FE \parallel BC$$

$$\therefore m(\angle ABC) = m(\angle AFE) \text{ (corresponding angles)}$$

$$\therefore m(\angle ACB) = m(\angle AEF) \text{ (corresponding angles)}$$

$$\therefore m(\angle AFE) > m(\angle AEF)$$



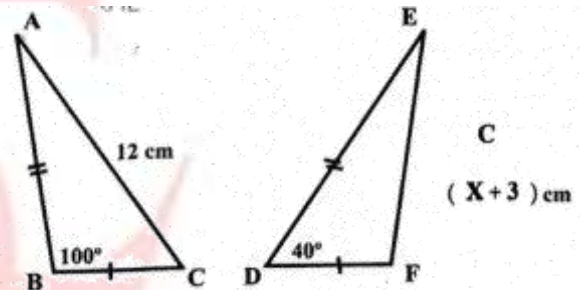
10) In the opposite figure

Find all possible values of x .

$$\therefore AB = DE, \quad BC = DF$$

$$m(\angle B) > m(\angle D)$$

$$\therefore AC > EF$$



$$AC = 12 \text{ cm}$$

$$EF = (x + 3) \text{ cm}$$

$$x + 3 < 12$$

$$x < 9$$

$$x + 3 > 0$$

$$x > -3$$

$$-3 < x < 9$$



11) In the opposite figure find the length of

Projection of $\overline{AC}$ on $\overline{BC}$

Projection of $\overline{AB}$ on $\overline{BC}$

Projection of $\overline{AD}$ on $\overline{BC}$

Projection of $\overline{AC}$ on $\overline{BC}$

$$BC = \sqrt{225 + 400} = 25$$

$$AD = \frac{15 \times 20}{25} = 12$$

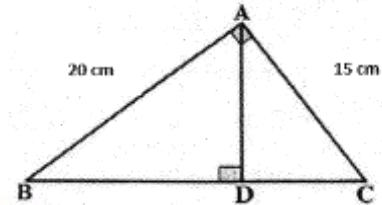
$$DC = \sqrt{225 - 144} = 9$$

Projection of $\overline{AB}$ on $\overline{BC}$

$$BD = \sqrt{400 + 144} = 16$$

Projection of $\overline{AD}$ on $\overline{BC}$

point D

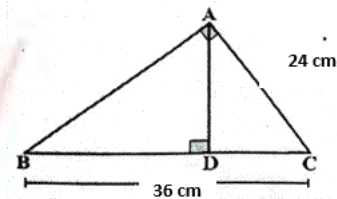


12) In the opposite figure find the length of AB , DC

$$AB = 12\sqrt{5}$$

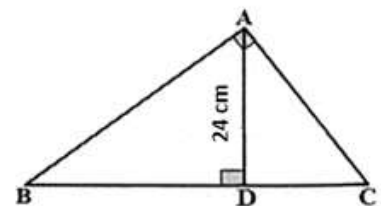
$$AD = 8\sqrt{5}$$

$$DC = 16$$

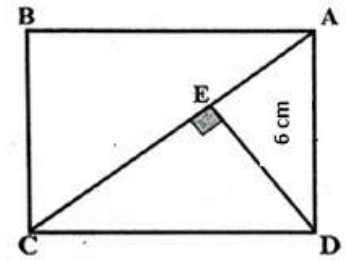


13) In the opposite figure find the length of $DC \times DB$

$$= 576 \text{ cm}$$

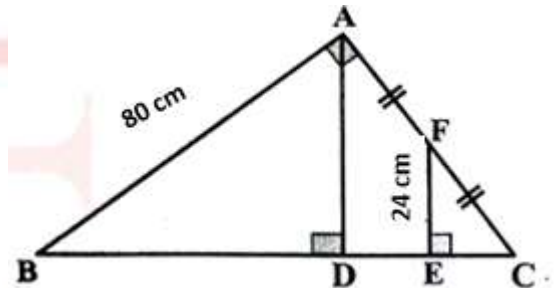


14) ABCD is a rectangle its area is 48 cm^2 $DE \perp AC$,
 $AD = 6 \text{ cm}$. find CD , AC , ED
 $= 4.8 \text{ cm}$

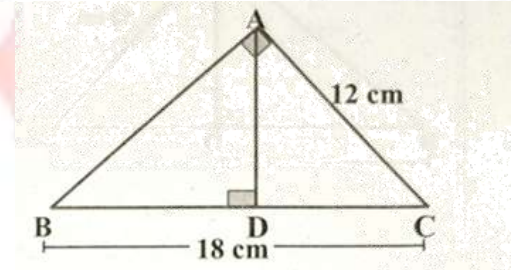


15) In the opposite figure

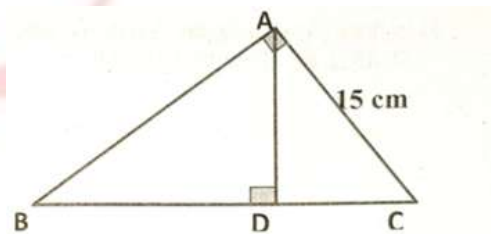
$AD, FE \perp BC$, $m(\angle BAC) = 90^\circ$
 $FE = 24 \text{ cm}$, $AB = 80 \text{ cm}$, $FA = FC$
 Find EC .
 $= 18 \text{ cm}$



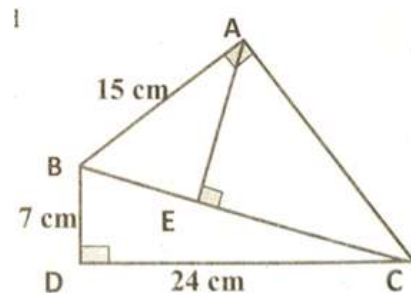
16) In the opposite figure: find DC
 $= 8 \text{ cm}$



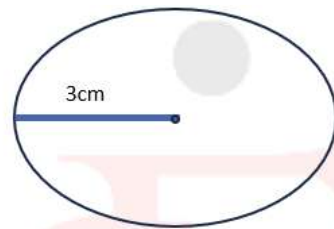
17) In the opposite figure:
 ABC is a triangle, its area is 150 cm^2
 Find: AB , AD
 $AB = 20 \text{ cm}$
 $AD = 12 \text{ cm}$



18) In the opposite figure:
 ABC is a right-angled triangle at A ,
 BDC is a right-angled triangle at D ,
 $AE \perp BC$.
 Find: BC , AC , AE
 $BC = 25 \text{ cm}$
 $AC = 20 \text{ cm}$
 $AE = 12 \text{ cm}$



19) Draw a circle N with a diameter of 6cm.



20) Find the circumference of the circle with a diameter of 8 feet ($\pi \approx 3.14$)

25.12 cm

21) A truck tire has a diameter of 120cm , what is the circumference of the tire ? if the tire makes a complete revolution what distance does the truck cover ?

How many revolutions does the tire need to cover a distance of 200 Km?
($\pi \approx 3.14$)

Circumference = 376.8 cm

Number of revolutions = $\frac{20,000,000\text{cm}}{376.8\text{cm}} = 53078.6$ revolutions

22) Find the area of a circle with a radius of 12 cm ? ($\pi \approx 3.14$)

452.16 cm²

23) Circle M touches the sides of squares ABCD from the inside where AD = 12cm. Find the circumference and area of the shaded region ($\pi \approx 3.14$)

Perimeter of square = 48 cm

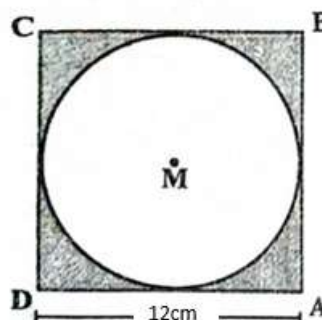
Circumference of the circle = 37.68 cm

Circumference of shaded = 85.68 cm

Area of square = 144 cm²

Area of the circle = 113.04 cm²

Area of shaded = 30.96 cm²



24) Right circular cylinder has a base diameter of 12 cm and a height of 8 cm. Find its volume, lateral area, and total area. ($\pi = 3.14$)

$$V = 904.32 \text{ cm}^3 \quad L.A = 301.44 \text{ cm}^2 \quad T.A = 527.52 \text{ cm}^2$$

25) Right circular cylinder has a volume of 1540 cm^3 and a base radius of 7 cm. Find its height, lateral area. ($\pi = \frac{22}{7}$)

$$H = 10 \text{ cm} \quad L.A = 440 \text{ cm}^2$$

26) A right quadrilateral prism has a square base with a side length of 8 cm and a height of 10 cm. Find the volume of the prism, its total area.

$$V = 640 \text{ cm}^3 \quad T.A = 448 \text{ cm}^2$$

27) A right triangular prism has a height of 10 cm and a volume of 120 cm^3 . Find the area of its base.

$$A = 12 \text{ cm}^2$$

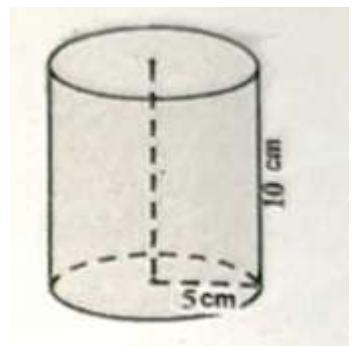
28) Which one has a larger volume? Right circular cylinder has a base diameter of 14 cm and a height of 10 cm, or a right quadrilateral prism has a square base with a side length of 10 cm and a height of 14 cm.

$$V \text{ of cylinder} = 1538 \text{ cm}^3 \quad V \text{ of prism} = 1400 \text{ cm}^3$$

Prism < cylinder

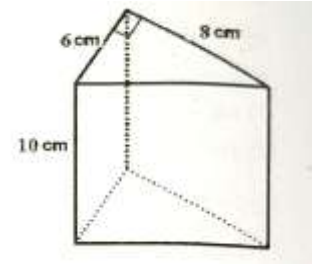
29) In the figure opposite: A right circular cylinder with a radius of 5 cm and a height of 10 cm. Find the volume of the cylinder.

$$V = 250\pi \text{ cm}^3$$



30) In the figure opposite: A right triangular prism with a height of 10 cm and a base that is a right triangle, with the lengths of the legs being 6 cm, 8 cm. Find the lateral area of the prism.

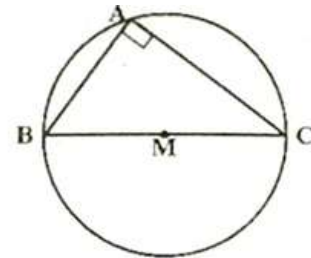
$$L.A = 240 \text{ cm}^2$$



31) In the figure opposite: $AB = 6 \text{ cm}$, $AC = 8 \text{ cm}$. Find the area and circumference of circle M in terms of π .

$$\text{circumference} = 10\pi \text{ cm}$$

$$\text{area} = 25\pi \text{ cm}^2$$



32) If $A(3, -5)$, $B(7, -2)$ find AB .

$$= 5 \text{ units}$$

33) If the distance between the two points $B(3, 2)$, $A(K, 8)$ is equal to 10 units of length find the value of K .

$$K = 11 \text{ or } -5$$

34) If $A(3, 1)$, $B(-5, 1)$, $C(-1, 4)$ prove that the points A, B, C are not collinear.

$$AB = 8 \text{ units}$$

$$BC = 5 \text{ units}$$

$$AC = 5 \text{ units}$$

$$AB \neq BC + AC \quad \text{points } A, B, C \text{ are not collinear.}$$

35) If $A(0, 6)$, $B(6, 0)$, $C(2, -4)$, $D(-4, 2)$ prove that the points A, B, C, D are the vertices of a rectangle.

$$AB = 6\sqrt{2} \text{ units}$$

$$BC = 4\sqrt{2} \text{ units}$$

$$CD = 6\sqrt{2} \text{ units}$$

$$DA = 4\sqrt{2} \text{ units}$$

$$AB=CD, \quad BC=DA$$

$$AC = \sqrt{104} \text{ units}$$

$$BD = \sqrt{104} \text{ units}$$

$$AC=BD$$

points A,B,C,D are the vertices of a rectangle.

36) Find the area of the circle whose center is the point $M(-3,2)$ and passes through the point $A(3,-6)$

$$\text{Area} = 100 \pi \text{ cm}^2$$

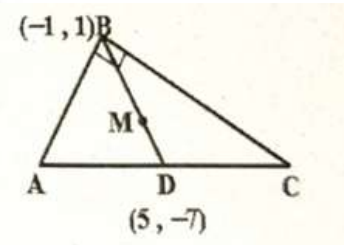
37) Find the circumference of the circle whose center is $M(15, 10)$ and passes through the point $A(3, -6)$.

$$\text{Radius} = 20 \text{ units}$$

$$\text{Circumference} = 2 \times \pi \times 20 = 40 \pi \text{ units}$$

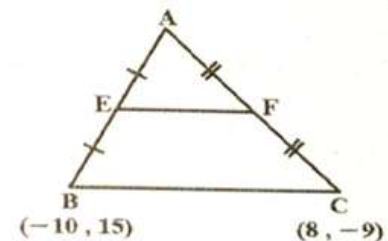
38) In the opposite figure, M is the intersection point of the medians of triangle ABC. Find AC.

$$AC = 20 \text{ units}$$



39) In the opposite figure, find EF.

$$EF = 15 \text{ units}$$



40) If the slope of the straight line passing through the two points $(k, 9)$, $(7, 2)$ is 7, find the value of k.

$$k = 4$$

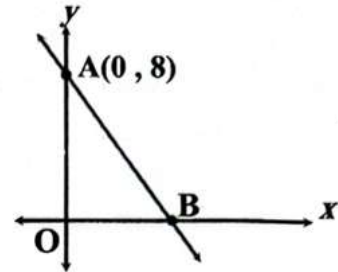
41) If the straight line passes through the two points (5, 1), (3, k) and is parallel to x-axis, find the value of k.

$$K = 1$$

42) In the opposite figure:

If the area of triangle OAB is 20 square units, find the slope of the straight line AB.

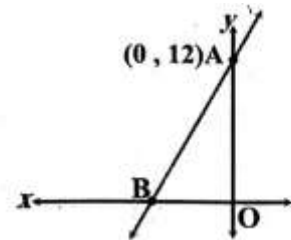
$$M = -\frac{8}{5}$$



43) In the opposite figure:

If the area of triangle OBA is 18 square units, find the slope of the straight line AB.

$$M = 4$$



Unit 4**Q1 Complete the following :-**

- 1) From the data collection methods: mass population , sample method.
- 2) Data collection sources are divided into two types: primary , secondary
- 3) The methods of selecting samples are: random sample , non-random sample
- 4) Types of random samples:
 - (1) The simple random sample. It is used in homogeneous populations.
 - (2) The layer random sample. It is used in non-homogeneous populations
- 5) From the advantages of the mass population method for data collection accuracy , and its disadvantages high cost , long time
- 6) From the advantages of the sampling method: saving time , effort , time and its disadvantages inaccuracy

Q2 Choose the correct answer:

- 1) From the primary sources for collecting data
- (a) bulletins of statistical centers.
 - (b) data of school students from last year.
 - (c) surveys.**
 - (d) records of employee data from one of the institutions.
- 2) All of the following are primary sources of data except
- (a) opinion polls.
 - (b) observation and measurement.
 - (c) websites.**
 - (d) personal interview.
- 3) From the secondary sources for collecting data
- (a) personal interview.
 - (b) surveys.
 - (c) employee database.**
 - (d) observation and measurement.
- 4) All of the following are considered secondary data sources except
- (a) media.
 - (b) central agency for public mobilization and statistics bulletins.
 - (c) registered student data at the school.
 - (d) asking students about their personal data.**

- 5) One of the disadvantages of using secondary sources to obtain data about a statistical population
- (a) requires a lot of time and effort.
 - (b) requires a large number of researchers in the case of large population.
 - (c) high cost.
 - (d) inaccuracy.
- 6) Mass population method is used to collect data in the case of
- (a) patient's blood test.
 - (b) quality testing of factory production.
 - (c) petrol exploration in a certain area.
 - (d) elections.
- 7) Sampling method is used to collect data in the case of
- (a) elections.
 - (b) final exam for students in the school.
 - (c) research on the spread of infection among the fruits of a certain crop.
 - (d) small statistical population.
- 8) One of the advantages of the sampling method
- (a) accuracy.
 - (b) comprehensive.
 - (c) the complete representation of all items in the population.
 - (d) saving time and effort.

- 9) The sample method is considered the appropriate method for each of the following except
- (a) examining factory production. (b) examining desert sands.
(c) knowing mass population. (d) examining a patient's blood.
- 10) Choosing the sample from only one layer of the statistical population is called the
- (a) randomness. (b) layering. (c) biased. (d) simple.
- 11) A factory has 75 technicians, 50 engineers. If a sample of size 50 individuals is to be chosen representing each layer according to its size, then the number of engineers in this sample equals engineer.
- (a) 30 (b) 20 (c) 25 (d) 15
- 12) A hospital has 40 doctors, 200 nurses, a layer sample of size 36 individuals was taken in which each layer is represented according to its size, then the number of nurses in this sample equals nurses.
- (a) 6 (b) 18 (c) 24 (d) 30
- 13) If the probability of a football team winning in a single match is 0.75, how many matches are expected to win out of a total of 24 matches?
- (a) 6 (b) 12 (c) 18 (d) 20
- 14) A factory produces 800 bulbs daily. If the probability that the bulb is defective is 0.03, then the expected number of working bulbs produced in one day is bulbs.
- (a) 24 (b) 124 (c) 560 (d) 776

- 15) A random sample of size 20 apples was selected from a shipment of apples, the number of corrupted apples was 2. If the total number of apples in the shipment was 2240 apples, what is the expected number of good apples in the shipment?
- (a) 224 (b) 18 (c) 2016 (d) 2220
- 16) The probability of obtaining a good rice crop in a village is $\frac{3}{5}$, and farmers planted X feddans of rice. If the expected number of feddans to produce a good crop is 30 feddans, what is the value of X?
- (a) 18 (b) 36 (c) 42 (d) 50
- 17) In a mixed school with 1200 students, a random sample of 90 students was chosen and it was found that the number of girls is 54, what is the expected number of girls in the school?
- (a) 480 girls (b) 660 girls (c) 720 girls (d) 840 girls
- 18) If the school media team consists of 18 members, including 4 teachers, 6 female students, 8 male students. If one of the team members was chosen randomly to give a speech, what is the probability that it is a male student or a teacher?
- (a) $\frac{2}{9}$ (b) $\frac{1}{3}$ (c) $\frac{4}{9}$ (d) $\frac{2}{3}$
- 19) The team work in one of the factories consists of 80 workers and 16 engineers, if one member of the team was randomly selected, then the probability that he is a worker equals
- (a) $\frac{1}{6}$ (b) $\frac{1}{3}$ (c) $\frac{2}{3}$ (d) $\frac{5}{6}$
- 20) A player shot 24 shots, he scored 3 goals, then the expected number of scored goals if he shots 56 shots is
- (a) 7 (b) 14 (c) 21 (d) 28

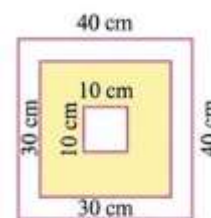
21) In the given figure: If a person aimed at the given board, what is the probability of hitting the colored area?

- (a) $\frac{1}{8}$ (b) $\frac{1}{4}$ (c) $\frac{3}{8}$ (d) $\frac{1}{2}$



22) In the given figure: If a shooter hit the board, what is the probability of hitting the colored part?

- (a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{1}{4}$ (d) $\frac{1}{5}$

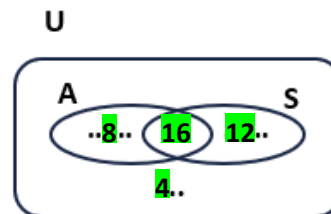


Q3 Answer the following :-

1) A random sample of 40 people was taken from the visitors of a public library, it was found that 28 of them prefer scientific books (S), 24 prefer literary books (A), and 16 prefer both types.

(1) Complete the Venn diagram.

(2) If one of the library visitors is chosen randomly, find each of the following probabilities:



- a) To be among those who prefer scientific books. $\frac{7}{10}$
- b) To be among those who prefer literary books. $\frac{3}{5}$
- c) To be among those who prefer only scientific books. $\frac{3}{10}$
- d) To be among those who prefer only literary books. $\frac{1}{5}$
- e) To be among those who do not prefer either of the two types. $\frac{1}{10}$
- f) To prefer at least one of the two types. $\frac{9}{10}$

(3) If the number of visitors to the library during a week is 3200 people, what is the expected number of those who prefer both types together? **1280**

2) A class has 36 students, 27 students passed in Mathematics, 12 students passed in Arabic, 9 students passed in both exams. If a student was chosen randomly

(1) Find the probability that the chosen student:

a) passed in Mathematics $\frac{3}{4}$

b) passed in Arabic $\frac{1}{3}$

c) failed in Arabic $\frac{2}{3}$

d) failed in both Mathematics and Arabic $\frac{1}{6}$

(2) If the total number of the school is 540 students, what is the expected number of students passing in Mathematics only? **270 students**

General Revision**Q1 Choose the correct answer:**

1. If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 5$ then the value of $\frac{a+d}{d}$ is
- (a) 25 (b) 125 (c) 5 (d) 126
2. If B(-3, 7), A(-4, 2), then the slope =
- (a) 11 (b) 9 (c) 7 (d) 5
3. If $(a + 1, 6) = (5, b - 3)$, what is the value of $a + b$?
- (a) 4 (b) 8 (c) 9 (d) 13
4. The mean proportion of the numbers 48 and 3 is
- (a) ± 6 (b) ± 12 (c) ± 144 (d) ± 1
5. The area of a circle with radius 3 cm =
- (a) 9π cm (b) 6π cm (c) 9π cm² (d) 6π cm²
6. The lateral area of a right triangular prism with height 10 cm and base sides of 3 cm, 4 cm, 5 cm =
- (a) 120 cm² (b) 108 cm² (c) 50 cm² (d) 96 cm²
7. If the school's media team consists of 24 members, including 6 teachers, 8 girls, and 10 boys, and a member is chosen at random to give a speech for the opening of the Grand Egyptian Museum, what is the probability that the member is a boy or a teacher?
- (a) $\frac{1}{4}$ (b) $\frac{2}{3}$ (c) $\frac{2}{7}$ (d) $\frac{1}{3}$
8. If the slope of the line passing through the points (4, k) and (3, 2) equals 6, then the value of k =
- (a) 4 (b) 6 (c) 8 (d) 10

9. One of the methods of data collection

- (a) Mass population (b) Primary (c) Historical (d) Secondary

10. If $\frac{a}{b} = \frac{b}{c} = 2$ which of the following is correct?

- (a) $a = 2c$ (b) $a = 4c$ (c) $a = 4b$ (d) $a = 2b$

11. If $\frac{b}{3} = \frac{a}{5}$ then $\frac{a-b}{a+b} = \dots\dots\dots$

- (a) $\frac{2}{5}$ (b) $\frac{1}{4}$ (c) 5 (d) $\frac{5}{8}$

12. If $\frac{5}{n} = \frac{3}{m}$, $m-n = 6$, then what is the value of m ?

- (a) 15 (b) -15 (c) 9 (d) -9

13. Which of the following numbers are proportional?

- (a) 2, 6, 4 (b) 8, 5, 3 (c) 3, 9, 27 (d) 4, 9, 1

14. $\{3\} \times \{5\} = \dots\dots\dots$

- (a) (3,5) (b) {(3,5)} (c) {15} (d) (3,5)

15. The ordered pair (0, 3) belongs to the function f where:

- (a) $f(x) = 2x + 1$ (b) $f(x) = x + 3$
(c) $f(x) = 3x - 1$ (d) $f(x) = 3x$

16. What is the solution set of the inequality $2 \geq 2x > -2$ in $\mathbb{R}$?

- (a) $] -1, 1[$ (b) $] -1, 1]$ (c) $[-1, 1[$ (d) $] -2, 2]$

17. If ABC is a triangle where: $m\angle B = 30^\circ$, $m\angle A = 100^\circ$ then

- (a) $AB < BC$ (b) $AB > BC$ (c) $AC > AB$ (d) $AC = BC$

18. If the probability of a team winning any match is 80%, how many matches are expected to be won out of a total of 30 matches?

- (a) 6 (b) 12 (c) 18 (d) 24

19. What is the distance between the points (4, 7) and (1, 11)?

- (a) 5 units (b) 6 units (c) 7 units (d) 8 units

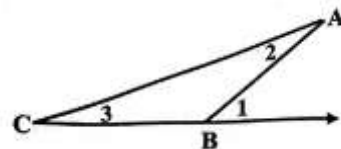
20. What is the slope of the line passing through points A(3, 2) and B(6, 2)?

- (a) 1 (b) 0 (c) Undefined (d) 2

21. In the opposite figure:

If $m\angle 3 < m\angle 2$, which of the following is correct?

- (a) $m\angle 3 < m\angle 2 < m\angle 1$ (b) $m\angle 1 < m\angle 3 < m\angle 2$
(c) $m\angle 3 < m\angle 1 < m\angle 2$ (d) $m\angle 2 < m\angle 3 < m\angle 1$



22. If $n(X \times Y) = 12$, $n(X) = 3$ then $n(Y^2) = \dots\dots\dots$

- (a) 4 (b) 8 (c) 15 (d) 16

23. If $f: \mathbb{R} \rightarrow \mathbb{R}$ and $f(x) = 3$, what is the value of $f(7)$?

- (a) 3 (b) 6 (c) 9 (d) 21

24. If $X = \{1, 3\}$, $Y = \{2, 8\}$, then: $(1, 1) \in \dots\dots\dots$

- (a) $X \times Y$ (b) $Y \times X$ (c) X^2 (d) Y^2

25. If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 5$, then the value of $\frac{a+b+c}{b+c+d}$ is ...

- (a) 15 (b) 5 (c) 25 (d) 1

26. The line representing the function f where $f(x) = 6 - 3x$ intersects the x -axis at the point ...

- (a) (0, -6) (b) (-2, 0) (c) (2, 0) (d) (6, 0)

27. the distance of point A (-3,4) from the x-axis is units.

- (a) -3 (b) 3 (c) 4 (d) 5

28. The slope of the line perpendicular the x-axis =

- (a) 0 (b) 1 (c) undefined (d) -1

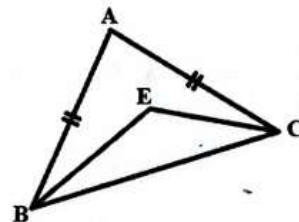
Q2 Answer the following:

1. If the following numbers are in proportion: 4, 5, x, 20. Find the value of x.

3. Find the number that, if subtracted from each of the numbers 16, 21, 14, 18, makes the numbers proportional.

3. In the opposite figure: $AC = AB$, $m(\angle EBC) < m(\angle ECB)$

Prove that: $m(\angle ACE) < m(\angle ABE)$



4. If a, b, c, d are in continued proportion, prove that: $\frac{c^2 - d^2}{a - c} = \frac{bd}{a}$
5. If the quantities a, b, c, d are proportional, prove that: $\frac{c+d}{d} = \frac{a+b}{b}$
6. Find the area of a circle with a circumference of 16π meters.
7. A right circular cylinder has a volume equal to the volume of a cube. If the radius of the cylinder's base is 10 cm and its height is 7 cm, find the edge length of the cube (rounding the answer to the nearest tenth).
8. Prove that the points $C(-3, 10), B(1, 6), A(5, 2)$ lie on the same straight line.

9. A hospital has 100 doctors and 200 nurses. A layer sample of 60 individuals was taken, representing each layer according to its size. Calculate the number of nurses.

10. If b is a mean proportional between a and c , prove that: $\frac{a-2b+c}{a-b} = \frac{a-c}{a+b}$

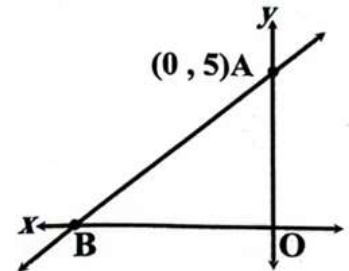
11. Prove that the points $A(4, 2)$, $B(7, 2)$, $C(7, -2)$ are the vertices of a right-angled triangle, and find its perimeter.

12. Represent graphically the function: $f(x) = 5-3x$

13. If $X = \{4, 5, 6, 7\}$ and $Y = \{1, 2, 3, 4\}$ and R is a relation from X to Y where xRy means: $x + y = 8$ for every $x \in X, y \in Y$

1. Write the relation as a set of ordered pairs.
2. Write the relation in table form.
3. Represent the relation using an arrow diagram.
4. Represent the relation graphically.
5. State the domain and range of the relation.

14. In the opposite figure: If the area of $\triangle OAB = 15$ square units, find the slope of AB .



15. If a, b, c, d are in continued proportion, prove that:

$(b + c)$ is the middle proportional between $(a + b)$ and $(c + d)$

16. If the slope of the line passing through the two points $(a, -11)$ and $(2a + 9, 3)$ is 7, find the value of a .

17. A right quadrilateral prism has a square base with side length 6 cm and height 5 cm.

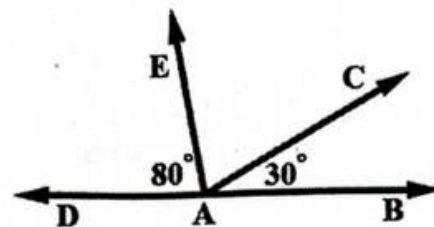
Find: the volume of the prism and its total surface area.

18. Find the solution set of the following inequality in $\mathbb{R}$, and represent it on the number line:

$$4x - 1 < 5x - 3 < 4x + 5$$

19. In the opposite figure: $m(\angle EAD) = 80$, $m(\angle CAB) = 30$, $A \in DB$

Prove that: $m(\angle DAC) > m(\angle BAE)$



20. If the points in the following table are collinear, find the slope of the line and the value of a :

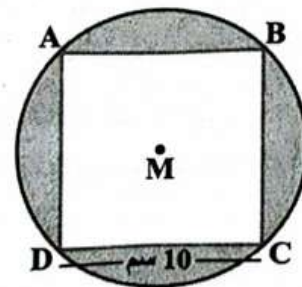
x	0	1	2	3
y	8	6	4	a

21. If $3x = 5y$, find the value of $(7x+3y):(x+2y)$

22. If the quantities 35, 15, 3, $2x+1$ are proportional. Find the numerical value of x .

23. In the opposite figure: A circle passes through the vertices of square ABCD, $DC = 10$ cm.

Find the perimeter and area of the shaded part. ($\pi \approx 3.14$)



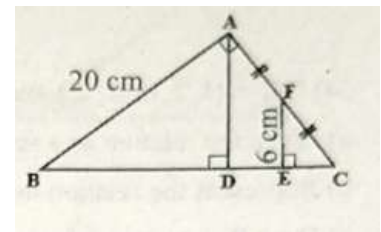
24. A right circular cylinder has a volume of $180\pi \text{ cm}^3$ and the radius of its base is 6 cm.

Find its height and its lateral surface area.

25. If: $\frac{b-a}{c-b} = \frac{3a-4b}{3b-4c}$ prove that: b is a mean proportional between a and c.

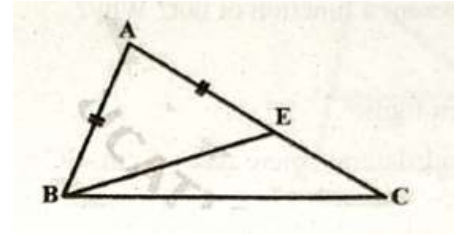
26. In the opposite figure: $m\angle BAC = 90^\circ$, $FE, AD \perp BC$, $FA = FC$, $AB = 20 \text{ cm}$, $EF = 6 \text{ cm}$.

Find: EC.



27. In the opposite figure: $C \in AE$, $AB = AE$

Prove that: $m(\angle ABE) > m(\angle C)$



28. In a class, some students wear glasses and some do not. If a student is selected randomly from this class, and the probability that this student wears glasses is 0.1, find the probability that the student does not wear glasses. If the number of students in this class is 40, find the expected number of students who wear glasses.

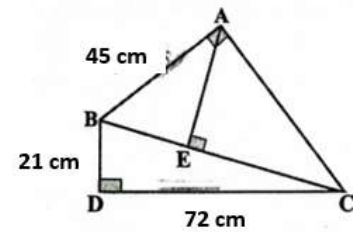
29. Find the solution set in $\mathbb{R}$ for the equation: $12 + 4x = 2(3 + 3x)$

30. If: $C = \{1, 7\}$, $B = \{2, 4, 7\}$, $A = \{1, 9, 7\}$, find:

- 1) $A \times C$ and represent it with an arrow diagram.
- 2) $B \times (A - C)$
- 3) $(A \cap B) \times C$
- 4) $n(A^2)$

31. In the given figure: $\triangle ABC$ is right-angled at D, $AE \perp BC$ is

Find BC, AC, AE



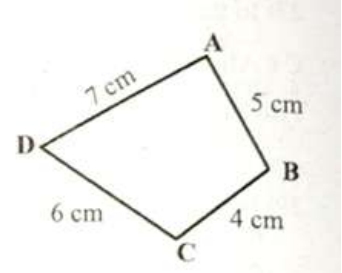
32. If b is a middle proportional between a and c , prove that: $\frac{a-2b+c}{a-b} = \frac{a-c}{a+b}$

33. A car insurance company pays an amount of 3,000 Egyptian pounds as compensation for a car involved in an accident. If the probability of a car being involved in an accident is 0.006 and the number of policyholders under this plan is 5,000, what is your expectation of the total compensation the company will bear?

34. If $X = \{1, 2, 0, -1, -2\}$ and R is a relation on X where xRy means: $x = -y$ for every $x \in X, y \in X$

- Write the relation as a set of ordered pairs.
- Represent the relation using an arrow diagram.
- Does R represent a function or not? Why?

35. In the given figure: ABCD is a quadrilateral where $AB = 5\text{ cm}$, $BC = 4\text{ cm}$, $CD = 6\text{ cm}$, $DA = 7\text{ cm}$. Prove that $m(\angle ABC) > m(\angle ADC)$



36. A car travels at a constant speed from a point 50 km away from Cairo. If the distance d (in kilometers), which represents how far the car is from Cairo after time t (in hours), is determined by the relation $d(t) = 50 + 100(t)$

a) Represent function d graphically

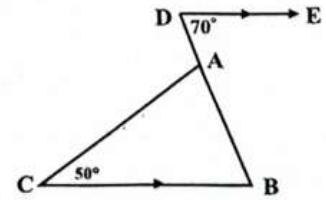
b) Find the time required for the distance of the car from Cairo to be 450 km

37. A triangle with side lengths: 9 cm, $(3x + 5)\text{ cm}$, 20 cm. What are the possible values of x ?

38. If b is the middle proportional between a and c , prove that: $\frac{a}{c} = \frac{4a^2 - 9b^2}{4b^2 - 9c^2}$
39. Prove that the points $A(2,7)$, $B(4,-3)$, $C(3,5)$ are vertices of a triangle and determine its type based on its angle.
40. If $\frac{2x+3}{2x-3} = \frac{2y+5}{2y-5}$, find the value of $X : Y$.
41. Find in terms of π the circumference of the circle whose center is at point $M (-6,6)$ and passes through point $A(3,-6)$.
42. If: $a : b : c = 2 : 3 : 4$ and $a^2 + b^2 + c^2 = 725$, find the value of $b+a-c$
43. If: $\frac{a+b+c}{8} = \frac{a-b}{11} = \frac{a+b}{25}$, find the ratio $a:b:c$

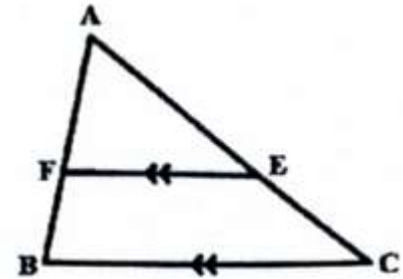
44. If: $D(-4,2)$, $C(2,-4)$, $B(6,0)$, $A(0,6)$, prove that points A,B,C,D are the vertices of a rectangle.

45. In the opposite figure: Prove that . $AC > AB$



46. In the opposite figure: ABC is a triangle where: $BC \parallel FE$, $AC > AB$

Prove that: $m(\angle AFE) > m(\angle AEF)$

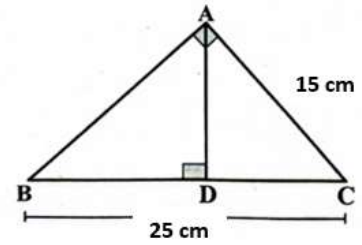


47. If $X = \{0, 1, 2, 3\}$, $Y = \{1, 2, 4, 6, 9\}$ and R is a relation from X to Y where xRy means: $y=x^2$ for each $x \in X$, $y \in Y$

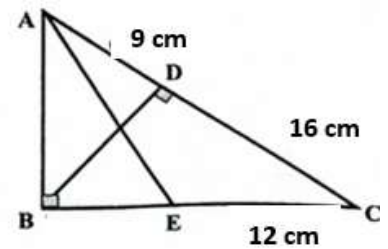
1. Write the relation as a set of ordered pairs.
2. Write the relation in a table form.
3. Represent the relation using an arrow diagram.
4. Represent the relation using a Cartesian diagram.
5. Mention the range and domain of the relation.

48. In the opposite figure: Find:

1. The length of AB
2. The projection of AC on BC
3. The projection of AD on BC
4. The length of the projection of AB on BC

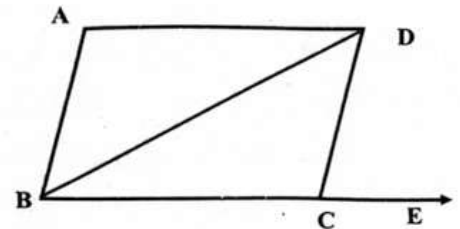


49. In the opposite figure: Triangle ABC is right-angled at B , $BD \perp AC$, $AD = 9$ cm , $CD = 16$ cm, $EC = 12$ cm . Find the length of AE.



50. In the opposite figure: ABCD is a parallelogram , $E \in BC$

Prove that: $m(\angle DCE) > m(\angle ADB)$.



51. A random sample of 50 students was selected from a school among the students who participated in the mathematics competition, and the students were distributed as shown in the following table:

	First	Second	Total
male student	8		
female student		4	10
Total			

First: Complete the previous table.

Second: Find the probability that the first-place winner will be:

1. A male student from the first grade
2. A female student
3. Someone from the second preparatory grade
4. A male student or someone from the first preparatory grade

Answers

General Revision

For more steps
watch **Q1 Choose the correct answer:**

1. If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 5$ then the value of $\frac{a+d}{d}$ is
- (a) 25 (b) 125 (c) 5 (d) **126**
2. If B(-3, 7), A(-4, 2), then the slope =
- (a) 11 (b) 9 (c) 7 (d) **5**
3. If $(a + 1, 6) = (5, b - 3)$, what is the value of $a + b$?
- (a) 4 (b) 8 (c) 9 (d) **13**
4. The mean proportion of the numbers 48 and 3 is
- (a) ± 6 (b) **± 12** (c) ± 144 (d) ± 1
5. The area of a circle with radius 3 cm =
- (a) 9π cm (b) 6π cm (c) **9π cm²** (d) 6π cm²
6. The lateral area of a right triangular prism with height 10 cm and base sides of 3 cm, 4 cm, 5 cm =
- (a) **120 cm²** (b) 108 cm² (c) 50 cm² (d) 96 cm²
7. If the school's media team consists of 24 members, including 6 teachers, 8 girls, and 10 boys, and a member is chosen at random to give a speech for the opening of the Grand Egyptian Museum, what is the probability that the member is a boy or a teacher?
- (a) $\frac{1}{4}$ (b) **$\frac{2}{3}$** (c) $\frac{2}{7}$ (d) $\frac{1}{3}$
8. If the slope of the line passing through the points (4, k) and (3, 2) equals 6, then the value of k =
- (a) 4 (b) 6 (c) **8** (d) 10

For more steps
watch 

9. One of the methods of data collection

- (a) **Mass population** (b) Primary (c) Historical (d) Secondary

10. If $\frac{a}{b} = \frac{b}{c} = 2$ which of the following is correct?

- (a) $a = 2c$ (b) **$a = 4c$** (c) $a = 4b$ (d) $a = 2b$

11. If $\frac{b}{3} = \frac{a}{5}$ then $\frac{a-b}{a+b} = \dots\dots\dots$

- (a) $\frac{2}{5}$ (b) **$\frac{1}{4}$** (c) 5 (d) $\frac{5}{8}$

12. If $\frac{5}{n} = \frac{3}{m}$, $m-n = 6$, then what is the value of m ?

- (a) 15 (b) -15 (c) 9 (d) **-9**

13. Which of the following numbers are proportional?

- (a) 2, 6, 4 (b) 8, 5, 3 (c) **3, 9, 27** (d) 4, 9, 1

14. $\{3\} \times \{5\} = \dots\dots\dots$

- (a) (3,5) (b) **$\{(3,5)\}$** (c) {15} (d) (3,5)

15. The ordered pair (0, 3) belongs to the function f where:

- (a) $f(x) = 2x + 1$ (b) **$f(x) = x + 3$**
(c) $f(x) = 3x - 1$ (d) $f(x) = 3x$

For more steps
watch 

16. What is the solution set of the inequality $2 \geq 2x > -2$ in $\mathbb{R}$?

- (a) $] -1, 1[$ (b) **$] -1, 1]$** (c) $[-1, 1[$ (d) $] -2, 2]$

17. If ABC is a triangle where: $m\angle B = 30^\circ$, $m\angle A = 100^\circ$ then

- (a) **$AB < BC$** (b) $AB > BC$ (c) $AC > AB$ (d) $AC = BC$

18. If the probability of a team winning any match is 80%, how many matches are expected to be won out of a total of 30 matches?

- (a) 6 (b) 12 (c) 18 (d) 24

19. What is the distance between the points (4, 7) and (1, 11)?

- (a) 5 units (b) 6 units (c) 7 units (d) 8 units

20. What is the slope of the line passing through points A(3, 2) and B(6, 2)?

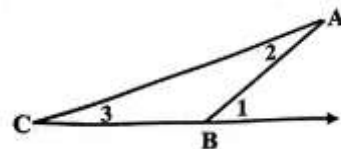
- (a) 1 (b) 0 (c) Undefined (d) 2

21. In the opposite figure:

If $m\angle 3 < m\angle 2$, which of the following is correct?

- (a) $m\angle 3 < m\angle 2 < m\angle 1$ (b) $m\angle 1 < m\angle 3 < m\angle 2$

- (c) $m\angle 3 < m\angle 1 < m\angle 2$ (d) $m\angle 2 < m\angle 3 < m\angle 1$



22. If $n(X \times Y) = 12$, $n(X) = 3$ then $n(Y^2) = \dots\dots\dots$

- (a) 4 (b) 8 (c) 15 (d) 16

23. If $f: \mathbb{R} \rightarrow \mathbb{R}$ and $f(x) = 3$, what is the value of $f(7)$?

- (a) 3 (b) 6 (c) 9 (d) 21

24. If $X = \{1, 3\}$, $Y = \{2, 8\}$, then: $(1, 1) \in \dots\dots\dots$

- (a) $X \times Y$ (b) $Y \times X$ (c) X^2 (d) Y^2

25. If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 5$, then the value of $\frac{a+b+c}{b+c+d}$ is ...

- (a) 15 (b) 5 (c) 25 (d) 1

26. The line representing the function f where $f(x) = 6 - 3x$ intersects the x -axis at the point ...

- (a) (0, -6) (b) (-2, 0) (c) (2, 0) (d) (6, 0)

27. the distance of point A (-3,4) from the x-axis is units.

- (a) -3 (b) 3 (c) 4 (d) 5

28. The slope of the line perpendicular the x-axis =

- (a) 0 (b) 1 (c) undefined (d) -1

For more steps
watch 

Q2 Answer the following:

1. If the following numbers are in proportion: 4, 5, x, 20. Find the value of x. = 16

2. Find the number that, if subtracted from each of the numbers 16, 21, 14, 18, makes the numbers proportional. = 6

3. In the opposite figure: $AC = AB$, $m(\angle EBC) < m(\angle ECB)$

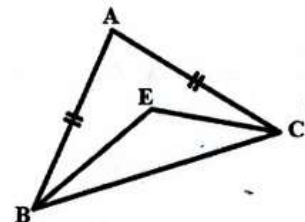
Prove that: $m(\angle ACE) < m(\angle ABE)$

Prove by yourself or watch the video on You Tube

4. If a, b, c, d are in continued proportion, prove that:

$$\frac{c^2 - d^2}{a - c} = \frac{bd}{a}$$

Prove by yourself or watch the video on You Tube



5. If the quantities a , b , c , d are proportional, prove that: $\frac{c+d}{d} = \frac{a+b}{b}$

Prove by yourself or watch the video on You Tube

6. Find the area of a circle with a circumference of 16π meters.

$$= 64 \pi \text{ cm}^2$$

7. A right circular cylinder has a volume equal to the volume of a cube. If the radius of the cylinder's base is 10 cm and its height is 7 cm, find the edge length of the cube (rounding the answer to the nearest tenth).

$$s \approx 13 \text{ cm}$$

8. Prove that the points $C(-3, 10)$, $B(1, 6)$, $A(5, 2)$ lie on the same straight line.

$$m_1 = m_2, \therefore A, B, C \text{ on the same straight line.}$$

For more steps
watch 

9. A hospital has 100 doctors and 200 nurses. A layer sample of 60 individuals was taken, representing each layer according to its size. Calculate the number of nurses.

$$\frac{200}{300} \times 60 = 40 \text{ nurses}$$

10. If b is a mean proportional between a and c , prove that: $\frac{a-2b+c}{a-b} = \frac{a-c}{a+b}$

Prove by yourself or watch the video on You Tube

11. Prove that the points $A(4, 2)$, $B(7, 2)$, $C(7, -2)$ are the vertices of a right-angled triangle, and find its perimeter.

$$AB = 3 \text{ cm} , AC = 5 \text{ cm} , BC = 4 \text{ cm}$$

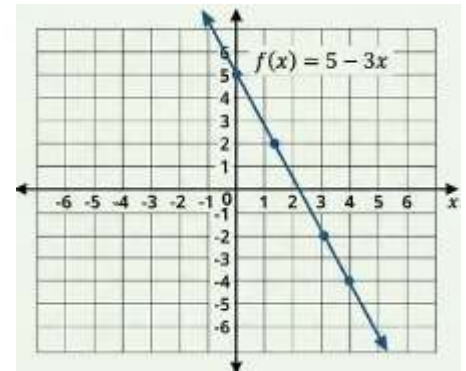
$$(AC)^2 = (AB)^2 + (BC)^2$$

A, B, C are the vertices of a right-angled triangle.

$$\text{Perimeter} = 3 + 4 + 5 = 12 \text{ cm}$$

12. Represent graphically the function: $f(x) = 5 - 3x$

X	0	1	2
$f(x)$	5	2	-1

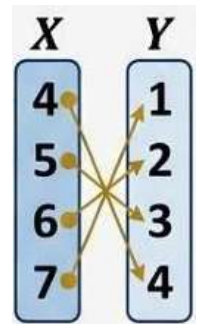
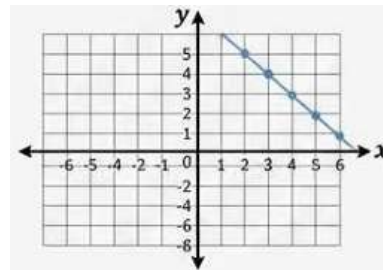


13. If $X = \{4, 5, 6, 7\}$ and $Y = \{1, 2, 3, 4\}$ and R is a relation from X to Y where xRy means: $x + y = 8$ for every $x \in X$, $y \in Y$

1. Write the relation as a set of ordered pairs. $R = \{(4, 4), (5, 3), (6, 2), (7, 1)\}$
2. Write the relation in table form.
3. Represent the relation using an arrow diagram.
4. Represent the relation graphically.
5. State the domain and range of the relation.

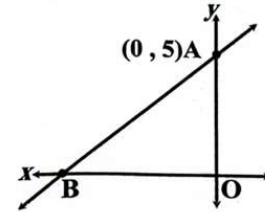
$$\text{Domain} = \{4, 5, 6, 7\}$$

$$\text{Range} = \{1, 2, 3, 4\}$$



14. In the opposite figure: If the area of $\triangle OAB = 15$ square units, find the slope of AB.

$$m = -\frac{5}{6}$$



15. If a, b, c, d are in continued proportion, prove that:

$(b + c)$ is the middle proportional between $(a + b)$ and $(c + d)$

Prove by yourself or watch the video on You Tube

16. If the slope of the line passing through the two points $(a, -11)$ and $(2a + 9, 3)$ is 7, find the value of a .

$$a = -7$$

For more steps
watch 

17. A right quadrilateral prism has a square base with side length 6 cm and height 5 cm.

Find: the volume of the prism and its total surface area.

$$\text{Volume} = 180 \text{ cm}^3$$

$$\text{Lateral area} = 120 \text{ cm}^2$$

$$\text{Surface area} = 192 \text{ cm}^2$$

18. Find the solution set of the following inequality in R , and represent it on the number line: $4x - 1 < 5x - 3 < 4x + 5$

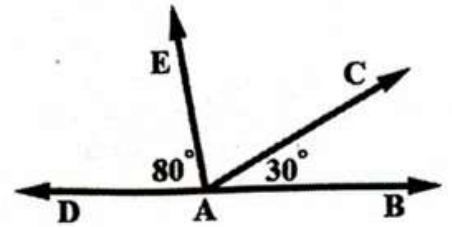
$$\text{S.S} =]2, 8[$$



19. In the opposite figure: $m(\angle EAD) = 80$, $m(\angle CAB) = 30$, $A \in DB$

Prove that: $m(\angle DAC) > m(\angle BAE)$

Prove by yourself or watch the video on You Tube



20. If the points in the following table are collinear, find the slope of the line and the value of a :

X	0	1	2	3
y	8	6	4	a

$$m = -2 \quad a = 2$$

21. If $3x = 5y$, find the value of $(7x+3y):(x+2y)$

$$= 4$$

22. If the quantities 35, 15, 3, $2x+1$ are proportional. Find the numerical value of x .

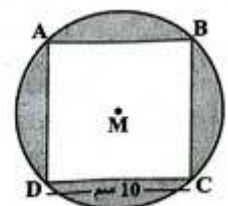
$$x = \frac{1}{7}$$

23. In the opposite figure: A circle passes through the vertices of square ABCD, $DC = 10$ cm.

Find the perimeter and area of the shaded part. ($\pi \approx 3.14$)

$$\text{perimeter of the shaded part} = 84.4 \text{ cm}$$

$$\text{area of the shaded part} = 57 \text{ cm}^2$$



24. A right circular cylinder has a volume of $180\pi \text{ cm}^3$ and the radius of its base is 6 cm.

Find its height and its lateral surface area.

$$H = 5 \text{ cm} \quad S.A = 60\pi \text{ cm}^2$$

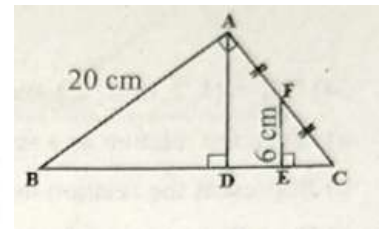
25. If: $\frac{b-a}{c-b} = \frac{3a-4b}{3b-4c}$ prove that: b is a mean proportional between a and c.

Prove by yourself or watch the video on You Tube

26. In the opposite figure: $m\angle BAC = 90^\circ$, $FE, AD \perp BC$, $FA = FC$, $AB = 20 \text{ cm}$, $EF = 6 \text{ cm}$.

Find: EC.

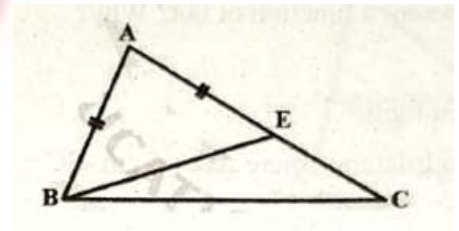
$$= 4.5 \text{ cm}$$



27. In the opposite figure: $C \in AE$, $AB = AE$

Prove that: $m(\angle ABE) > m(\angle C)$

Prove by yourself or watch the video on You Tube



28. In a class, some students wear glasses and some do not. If a student is selected randomly from this class, and the probability that this student wears glasses is 0.1, find the probability that the student does not wear glasses. If the number of students in this class is 40, find the expected number of students who wear glasses.

= 4 students

29. Find the solution set in $\mathbb{R}$ for the equation: $12 + 4x = 2(3 + 3x)$

S.S = {3}

30. If: $C = \{1, 7\}$, $B = \{2, 4, 7\}$, $A = \{1, 9, 7\}$, find:

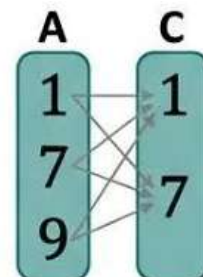
1) $A \times C$ and represent it with an arrow diagram.

= $\{(1,1), (1,7), (7,1), (7,7), (9,1), (9,7)\}$

2) $B \times (A - C) = \{(2,9), (4,9), (7,9)\}$

3) $(A \cap B) \times C = \{(7,1), (7,7)\}$

4) $n(A^2) = 9$



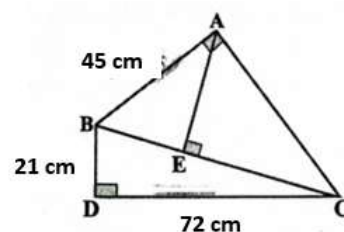
31. In the given figure: $\triangle ABC$ is right-angled at D, $AE \perp BC$ is

Find BC, AC, AE

BC = 75 cm

AC = 60 cm

AE = 36 cm



32. If b is a middle proportional between a and c, prove that: $\frac{a-2b+c}{a-b} = \frac{a-c}{a+b}$

Prove by yourself or watch the video on You Tube

33. A car insurance company pays an amount of 3,000 Egyptian pounds as compensation for a car involved in an accident. If the probability of a car being involved in an accident is 0.006 and the number of policyholders under this plan is 5,000, what is your expectation of the total compensation the company will bear?

The expected number car involved in an accident = $0.006 \times 5000 = 30$ cars

The expectation of the total compensation $30 \times 3000 = 90,000$ pounds

34. If $X = \{1, 2, 0, -1, -2\}$ and R is a relation on X where xRy means: $x = -y$ for every $x \in X, y \in X$

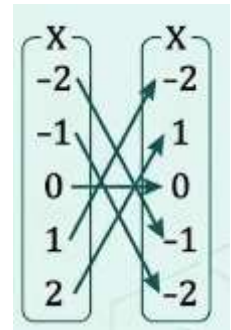
a) Write the relation as a set of ordered pairs. =

$\{(1, -1), (2, -2), (0, 0), (-1, 1), (-2, 2)\}$

b) Represent the relation using an arrow diagram.

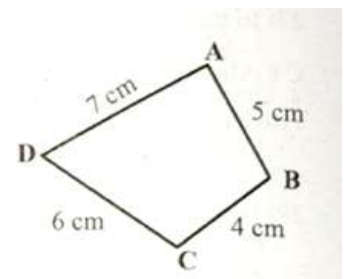
c) Does R represent a function or not? Why?

R is a function because each element $\in X$ appears once in R



35. In the given figure: ABCD is a quadrilateral where $AB = 5$ cm, $BC = 4$ cm, $CD = 6$ cm, $DA = 7$ cm. Prove that $m(\angle ABC) > m(\angle ADC)$

Prove by yourself or watch the video on You Tube



36. A car travels at a constant speed from a point 50 km away from Cairo. If the distance d (in kilometers), which represents how far the car is from Cairo after time t (in hours), is determined by the relation $d(t) = 50 + 100(t)$

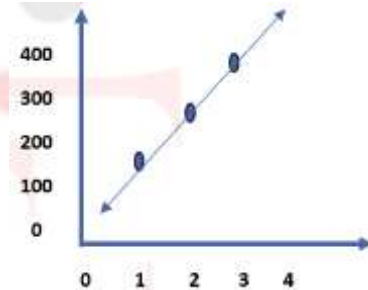
a) Represent function d graphically

b) Find the time required for the distance of the car from Cairo to be 450 km = 4 hours

$$d(1) = 50 + 100(1) = 150$$

$$d(2) = 50 + 100(2) = 250$$

$$d(3) = 50 + 100(3) = 350$$



37. A triangle with side lengths: 9 cm, $(3x + 5)$ cm, 20 cm. What are the possible values of x ?

$$x \in]2, 8[$$

38. If b is the middle proportional between a and c , prove that: $\frac{a}{c} = \frac{4a^2 - 9b^2}{4b^2 - 9c^2}$

Prove by yourself or watch the video on You Tube

39. Prove that the points $A(2,7)$, $B(4,-3)$, $C(3,5)$ are vertices of a triangle and determine its type based on its angle.

$$AB = 2\sqrt{26} \quad BC = \sqrt{65} \quad AC = \sqrt{5} \quad \text{obtuse triangle}$$

40. If $\frac{2x+3}{2x-3} = \frac{2y+5}{2y-5}$, find the value of $X : Y = \frac{3}{5}$

41. Find in terms of π the circumference of the circle whose center is at point $M(-6,6)$ and passes through point $A(3,-6)$.

$$= 30\pi \text{ cm}$$



42. If: $a : b : c = 2 : 3 : 4$ and $a^2 + b^2 + c^2 = 725$, find the value of $b+a-c$
= 5

43. If: $\frac{a+b+c}{8} = \frac{a-b}{11} = \frac{a+b}{25}$, find the ratio $a:b:c$

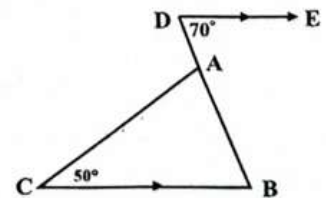
18 : 7 : -17

44. If: $D(-4,2)$, $C(2,-4)$, $B(6,0)$, $A(0,6)$, prove that points A,B,C,D are the vertices of a rectangle.

Prove by yourself or watch the video on You Tube

45. In the opposite figure: Prove that . $AC > AB$

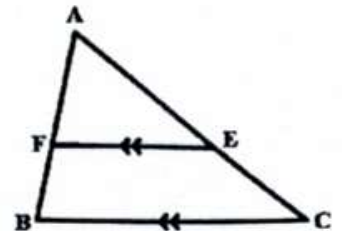
Prove by yourself or watch the video on You Tube



46. In the opposite figure: ABC is a triangle where: $BC \parallel FE$, $AC > AB$

Prove that: $m(\angle AFE) > m(\angle AEF)$

Prove by yourself or watch the video on You Tube



47. If $X = \{0, 1, 2, 3\}$, $Y = \{1, 2, 4, 6, 9\}$ and R is a relation from X to Y where xRy means: $y=x^2$ for each $x \in X$, $y \in Y$

1. Write the relation as a set of ordered pairs. $\{(1, 1), (2, 4), (3, 9)\}$

2. Write the relation in a table form.

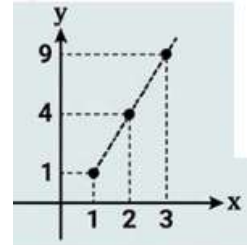
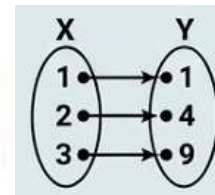
X	1	2	3
F(x)	1	4	9

3. Represent the relation using an arrow diagram.

4. Represent the relation using a Cartesian diagram.

5. Mention the range and domain of the relation.

Domain = $\{1, 2, 3\}$ Range $\{1, 4, 9\}$



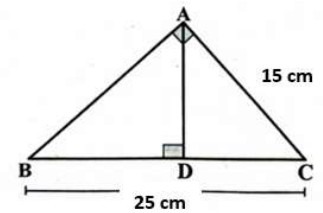
48. In the opposite figure: Find:

1. The length of $AB = 20$ cm

2. The projection of AC on BC $CD = 9$ cm

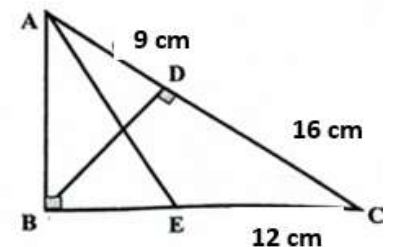
3. The projection of AD on $BC = 0$

4. The length of the projection of AB on BC $BD = 16$ cm



49. In the opposite figure: Triangle ABC is right-angled at B , $BD \perp AC$, $AD = 9$ cm, $CD = 16$ cm, $EC = 12$ cm. Find the length of AE .

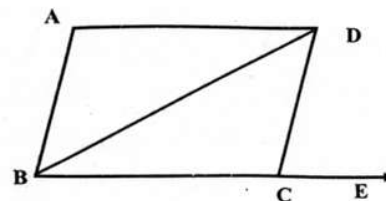
$= 17$ cm



50. In the opposite figure: ABCD is a parallelogram , $E \in BC$

Prove that: $m(\angle DCE) > m(\angle ADB)$.

Prove by yourself or watch the video on You Tube



51. A random sample of 50 students was selected from a school among the students who participated in the mathematics competition, and the students were distributed as shown in the following table:

	First	Second	Total
male student	8	32	40
female student	6	4	10
Total	14	36	50

First: Complete the previous table.

Second: Find the probability that the first-place winner will be:

5. A male student from the first grade = $\frac{4}{25}$

6. A female student = $\frac{1}{5}$

7. Someone from the second preparatory grade = $\frac{18}{25}$

8. A male student or someone from the first preparatory grade = $\frac{23}{25}$

كيفية طباعة صفحات معينة من ملف معين مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



حمل الآن

مجاناً وحصرياً

المراجعة رقم (2)

الترم الثاني



$$(x+y)^2 - (x-y)^2$$

$$\frac{a^m}{a^n} = a^{m-n}$$

$$c^2 = a^2 + b^2$$



Q1: Choose the correct answer

1 If $(a + 5, 3) = (8, b - 1)$ then $\sqrt{a^2 + b^2}$

(a) 7

(b) 3

(c) 9

(d) 5

2 If $n(X^2) = 9$ and $n(X \times Y) = 6$, then $n(Y^2) = \dots\dots\dots$

(a) 2

(b) 3

(c) 4

(d) 8

3 If $n(X^2) = 9$, then $n(X) = \dots\dots\dots$

(a) 3

(b) ± 3

(c) 9

(d) ± 9

4 The projection of a point on a given straight line is

(a) a point

(b) a line segment

(c) a ray

(d) a straight line

5 If $\frac{x}{5} = \frac{y}{4} = \frac{x+2y}{k}$, then $k = \dots\dots\dots$

(a) 9

(b) 13

(c) 14

(d) 8

6 The positive middle proportional between a and b is

(a) $\sqrt{ab}$

(b) $-\sqrt{ab}$

(c) $\pm\sqrt{ab}$

(d) ab

7 The third proportional of 9 and -12 is

(a) -16

(b) 8

(c) 16

(d) 108

8 The interval $[-1, 2[$ is the solution set in R for the inequality:

(a) $-1 < x < 2$

(b) $-1 < x \leq 2$

(c) $-1 \leq x < 2$

(d) $-1 \leq x \leq 2$

9 One of the advantages of sampling is

(a) accuracy

(b) comprehensiveness

(c) complete representation of all population members

(d) saving time and effort



- 10 If $f(x) = x^2$, $g(x) = x + 4$, what is the value of $5f(2) + 2g(5)$?
- (a) 18 (b) 20 (c) 38 (d) 70
- 11 If $(a, a) \in f$ where $f(x) = 2x + 3$, then $a = \dots\dots\dots$
- (a) 3 (b) -3 (c) 0 (d) 1
- 12 If R is a relation where $R = \{(1, 7), (2, 8), (3, 7), (5, 8)\}$, Then the range = $\dots\dots\dots$
- (a) $\{1, 2, 3, 5\}$ (b) $\{7, 8, 5\}$ (c) $\{7, 8\}$ (d) $\{1, 2, 7, 8\}$
- 13 If $(x, 7)$ is located on Y-axis, then $5x + 1 = \dots\dots\dots$
- (a) 0 (b) 1 (c) 5 (d) 6
- 14 If $(k^2 - 4, k)$ lies on the negative direction of Y-axis, then $k = \dots\dots\dots$
- (a) 2 (b) ± 2 (c) -2 (d) 0
- 15 If the lateral area of a right circular cylinder equals $2\pi r^2 \text{ cm}^2$, what is its height?
- (a) $\frac{1}{2}r \text{ cm}$ (b) $\frac{3}{4}r \text{ cm}$ (c) $r \text{ cm}$ (d) $2r \text{ cm}$
- 16 If $f(x) = 3$, then $f(-5) - f(5) = \dots\dots\dots$
- (a) 6 (b) 1 (c) zero (d) -1
- 17 The distance between the point $(-5, -2)$ and the y-axis is $\dots\dots\dots$ length unit.
- (a) -5 (b) -2 (c) 2 (d) 5
- 18 In triangle ABC, If $AB = 3 \text{ cm}$, and $BC = 5 \text{ cm}$, then $AC \in \dots\dots\dots$
- (a) $]3, 8]$ (b) $[2, 8]$ (c) $]2, 8[$ (d) $]2, 5[$
- 19 If $n(X \times Y) = 6$ and $Y = \{2\}$, then $n(X^2) = \dots\dots\dots$
- (a) 4 (b) 9 (c) 16 (d) 36



20 What is the S.S. for the inequality: $5x \leq 25$ in $\mathbb{R}$?

- (a) $]-\infty, 5[$ (b) $]5, \infty[$ (c) $[5, \infty[$ (d) $]-\infty, 5]$

21 If $f(x) = 4$, then $f(4) \div f(10) = \dots\dots\dots$

- (a) 4 (b) $\frac{2}{5}$ (c) 1 (d) 10

22 If $R = \{(1,3), (2,5), (4,3)\}$ represent a function, then its domain = $\dots\dots\dots$

- (a) $\{1, 2, 4\}$ (b) $\{3, 5, 4\}$ (c) $\mathbb{Z}$ (d) $\mathbb{N}$

23 What is the area of the circle whose radius length is 10 m?

- (a) $5\pi \text{ m}^2$ (b) $10\pi \text{ m}^2$ (c) $25\pi \text{ m}^2$ (d) $100\pi \text{ m}^2$

24 What is the diameter of a circle whose area = 36π square inches?

- (a) 6 inches (b) 12 inches (c) 18 inches (d) 36 inches

25 If 6 is the middle proportional between m and 2, then $m = \dots\dots\dots$

- (a) 8 (b) 12 (c) 18 (d) 36

26 If $\frac{a}{b} = \frac{b}{c} = \frac{c}{5} = 2$, then $a = \dots\dots\dots$

- (a) 5×2^2 (b) 40 (c) 10 (d) 2×5^3

27 If $a, 2, 4, b$ are in a continued proportional, then $a + b = \dots\dots\dots$

- (a) 1 (b) 8 (c) 7 (d) 9

28 What is the distance of the point $A(-3, 4)$ from the origin?

- (a) 3 units (b) 4 units (c) 5 units (d) 7 units

29 If $X = \{3, 4\}$, then $n(X \times \emptyset) = \dots\dots\dots$

- (a) 0 (b) 1 (c) 2 (d) $\emptyset$



30 $f(x) = 3x$ is represented by a straight line passes through the point

- (a) (3, 3) (b) (3, 0) (c) (0, 0) (d) (0, 3)

31 If $f(x) = 5$, then $f(-3) = \dots\dots\dots$

- (a) 5 (b) -5 (c) -3 (d) -15

32 If (a, 3) lies on the straight line that represents $f(x) = 2x - 5$, then a =

- (a) 2 (b) 1 (c) -2 (d) 4

33 If $f(x) = 3x + b$ and $f(4) = 13$, then b =

- (a) 1 (b) 2 (c) 0 (d) 3

34 If the point (k, 5) lies on the straight line representing the function f where $f(x) = 2x - 7$, what is the value of k ?

- (a) 3 (b) 4 (c) 5 (d) 6

35 In any circle, what is the value of $\frac{C}{d}$?

- (a) $\frac{\pi}{2}$ (b) π (c) 2π (d) $\frac{2}{\pi}$

36 If x, 4, y, 5 are proportional quantities, then $x : y = \dots\dots\dots$

- (a) 4 : 5 (b) 5 : 4 (c) 4 : 1 (d) 5 : 1

37 A right quadrilateral prism whose base is in the shape of a square with side length 10 cm. If the height of the prism is 8 cm, What is its volume

- (a) 80 cm^3 (b) 160 cm^3 (c) 320 cm^3 (d) 800 cm^3

38 If $\frac{x}{5} = \frac{y}{4} = \frac{x+2y}{k}$, then k =

- (a) 9 (b) 14 (c) 13 (d) 8



39 What's the third proportional for x^4 , $2x^3$?

- (a) $2x^2$ (b) $2x$ (c) $4x^3$ (d) $4x^2$

40 If: $3a = 5b = 4c$, then $a : b : c$ equals

- (a) $9 : 12 : 16$ (b) $20 : 12 : 15$ (c) $15 : 10 : 9$ (d) $8 : 5 : 3$

41 Which of the following relations is represented by a straight line parallel to the x-axis ?

- (a) $2y = 6$ (b) $2x = 6$ (c) $x = -y$ (d) $x - y = 0$

42 If the point $(a, 5) \in Y$ -axis, then $a = \dots\dots\dots$

- (a) 0 (b) 5 (c) -5 (d) 25

43 If $\{2\} \times \{x, y\} = \{(2, 4), (2, 3)\}$, then $x - y = \dots\dots\dots$

- (a) 1 (b) -1 (c) ± 1 (d) 0

44 If the point $(3, b - 5)$ lies on the x-axis, then $2b + 1 = \dots\dots\dots$

- (a) Zero (b) 5 (c) 11 (d) 8

45 What is the S.S. for the inequality: $3 \geq x > -3$ in R ?

- (a) $] -3, 3[$ (b) $] -3, 3]$ (c) $[-3, 3[$ (d) $[-3, 3]$

46 What is the solution set of the inequality $-x > 3$ in R ?

- (a) $] -\infty, -3[$ (b) $] -\infty, 3[$ (c) $] -3, \infty[$ (d) $] 3, \infty[$

47 If the straight line representing the function f where $f(x) = kx + 4$ passes through the point $(1, 1)$, what is the value of $f(-1)$?

- (a) -7 (b) -1 (c) 1 (d) 7



48 The distance between the point $(\sqrt{3}, 1)$ and the origin point is

- (a) 4 (b) 3 (c) 2 (d) 1

49 If $n(X) = 2$ and $Y = \{1, 2\}$, then $n(X \times Y) = \dots\dots\dots$

- (a) 4 (b) 3 (c) 5 (d) 6

50 If $(3, 5) \in \{(3, x), (3, 8), (6, 8)\}$, then $X = \dots\dots\dots$

- (a) 8 (b) 3 (c) 5 (d) 6

51 If $X = \{1, 2\}$ and $Y = \{3, 4\}$, then $(3, 4) \in \dots\dots\dots$

- (a) $X \times Y$ (b) $Y \times X$ (c) X^2 (d) Y^2

52 If $X = \{2\}$ and $Y = \{3\}$, then $X \times Y = \dots\dots\dots$

- (a) 6 (b) $\{6\}$ (c) $(2, 3)$ (d) $\{(2, 3)\}$

53 In ΔABC , if $AB < AC$, then $m(\angle B) \dots\dots\dots m(\angle C)$

- (a) $>$ (b) $=$ (c) $<$ (d) $\leq$

54 The middle proportional between 5 and 20 is

- (a) 10 (b) -10 (c) 100 (d) ± 10

55 The middle proportional between $(x - 2)$ and $(x + 2)$ is

- (a) $\sqrt{x + 2}$ (b) $\sqrt{x^2 - 4}$ (c) $x^2 - 4$ (d) $\pm \sqrt{x^2 - 4}$

56 If $a, 3, 9, b$ are continued proportional quantities, find the value of: $b + a = \dots\dots\dots$

- (a) 3 (b) 9 (c) 27 (d) 28

57 If $\frac{a}{5} = \frac{b}{7}$, then $7a - 5b + 3 = \dots\dots\dots$

- (a) 3 (b) 7 (c) 5 (d) 2



58 If a , x , b and $2x$ are proportional quantities, then $a : b = \dots\dots\dots$

- (a) 1 : 2 (b) 2 : 1 (c) 1 : 3 (d) 1 : 4

59 If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 2$, then the value of $\frac{a+d}{d} = \dots\dots\dots$

- (a) 5 (b) 7 (c) 8 (d) 9

60 If $\frac{a}{b} = \frac{c}{d} = \frac{3}{5}$, then $\frac{a+c}{b+d} = \dots\dots\dots$

- (a) $\frac{5}{3}$ (b) $\frac{3}{5}$ (c) $\frac{6}{5}$ (d) $\frac{5}{6}$

61 If a is the first proportional for the numbers 4 and 16, what is the value of a ?

- (a) 1 (b) 2 (c) 4 (d) 8

62 What is the fourth proportional for the quantities 2, 4, 5?

- (a) 12 (b) 10 (c) 3 (d) 6

63 If the straight line that represents the function $f(x) = 2x - a$ passes through the origin, then $a = \dots\dots\dots$

- (a) -3 (b) 2 (c) 0 (d) 3

64 What is the solution set of the inequality $5 > -x > -3$ in $\mathbb{R}$?

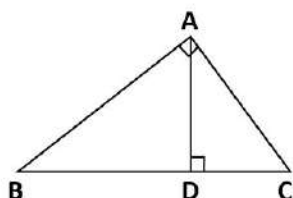
- (a) $[-5, 3]$ (b) $] -5, 3 [$ (c) $[-3, 5]$ (d) $] -3, 5 [$

65 If a , b , 2, 3 are proportional, then $\frac{b}{a} = \dots\dots\dots$

- (a) $\frac{3}{2}$ (b) $\frac{2}{3}$ (c) 3 (d) 2

66 In the given figure, which of the following is correct?

- (a) $(AB)^2 = BD \times DC$ (b) $(AB)^2 = BC \times AC$
(c) $(AB)^2 = BD \times BC$ (d) $(AB)^2 = BC \times DC$



67 Which of the following Cartesian product does the point $(\frac{1}{5}, \sqrt{5})$ belong to?

- (a) $N \times N$ (b) $Z \times Z$ (c) $Q \times Q$ (d) $R \times R$

68 If X, Y are two sets where $n(X \times Y) = 11$, then $n(X) + n(Y) = \dots\dots\dots$

- (a) 8 (b) 9 (c) 11 (d) 12

69 If $X = \{5, 7, 8\}$, $Y = \{9, 10\}$ and R is a function from X to Y where:
 $R = \{(5, 9), (8, 9), (k, 9)\}$, what is the value of k ?

- (a) 5 (b) 7 (c) 8 (d) 9

70 The ordered pair $(1, 2)$ belongs to the function f where: $\dots\dots\dots$

- (a) $f(x) = 2x - 1$ (b) $f(x) = -3x + 7$ (c) $f(x) = 2x + 1$ (d) $f(x) = -3x + 5$

71 The straight line representing the function f where $f(x) = 3x - 12$ cuts the x -axis at the point:

- (a) $(-12, 0)$ (b) $(12, 0)$ (c) $(4, 0)$ (d) $(-4, 0)$

72 A right circular cylinder has volume $= 40\pi \text{ cm}^3$ and height $= 10 \text{ cm}$.
Its base radius $= \dots\dots\dots$

- (a) 1 cm (b) 2 cm (c) 3 cm (d) 4 cm

73 If $4x^2 = 9y^2$, then $\frac{x}{y} = \dots\dots\dots$

- (a) $\frac{9}{4}$ (b) $\frac{3}{2}$ (c) $\pm \frac{3}{2}$ (d) $\pm \frac{2}{3}$

74 Which of the following is a secondary source for collecting data?

- (a) Personal interview (b) Questionnaires
(c) Employee database (d) Observation and measurement



75 The areas of two circles are 64π , 100π , what is the ratio between their circumferences?

- (a) 3 : 4 (b) 4 : 5 (c) 9 : 16 (d) 16 : 25

76 What is the slope of the straight line passing through the two points
A (-2, 3), B (5, 7)?

- (a) $\frac{7}{4}$ (b) $\frac{4}{7}$ (c) $\frac{4}{3}$ (d) $\frac{2}{3}$

77 If $\frac{4}{x} = \frac{7}{y} = \frac{b}{y-x}$, then b =

- (a) 3 (b) -3 (c) 11 (d) -11

78 If $\frac{a}{b} = \frac{c}{d} = k$ where $k \neq 0$, then $\frac{a \times c}{b \times d} = \dots\dots\dots$

- (a) $2k^2$ (b) k^2 (c) k (d) 2k

79 The circumference of a circle is 10π cm, what is its area?

- (a) $25\pi \text{ cm}^2$ (b) $50\pi \text{ cm}^2$ (c) $75\pi \text{ cm}^2$ (d) $100\pi \text{ cm}^2$

80 A hospital has 40 doctors, 200 nurses, a layer sample of size 36 individuals was taken in which each layer is represented according to its size, then the number of nurses in this sample equals nurses?

- (a) 6 (b) 18 (c) 24 (d) 30

81 If $5a - 4b = 0$, then $\frac{a}{b} = \dots\dots\dots$

- (a) $\frac{4}{5}$ (b) $\frac{5}{4}$ (c) $-\frac{4}{5}$ (d) $-\frac{5}{4}$

82 A right pentagonal prism whose height is 8 cm, and its volume is 168 cm^3 , what is its base area?

- (a) $1,344 \text{ cm}^2$ (b) 176 cm^2 (c) 21 cm^2 (d) 18 cm^2



83 In a mixed school with 1,200 students, a random sample of 90 students was chosen, and it was found that the number of girls is 54, what is the expected number of girls in the school?

- (a) 480 girls (b) 660 girls (c) 720 girls (d) 840 girls

84 If $f(x + 3) = x - 3$, then $f(7) = \dots\dots\dots$

- (a) 4 (b) 1 (c) 7 (d) 10

85 The number that must be added to the numbers 1,3,6 to be in a continued proportional is

- (a) 1 (b) 2 (c) 3 (d) 4

86 What is the area of the circle whose center is the point A $(-3, 5)$, and passes through the point B $(9, -4)$?

- (a) 15π sq units (b) 225π sq units (c) 13π sq units (d) 144π sq units

87 A right pentagonal prism whose base is a regular pentagon with area 10 m^2 , and the area of one of its lateral rectangles is 9 m^2 , what is the total area of the prism?

- (a) 19 m^2 (b) 38 m^2 (c) 55 m^2 (d) 65 m^2

88 If $f(x) = kx + 8$ and $f(2) = 0$, then $k = \dots\dots\dots$

- (a) 8 (b) 6 (c) 4 (d) -4



$$(x+y)^2 - (x-y)^2$$

$$\frac{a^m}{a^n} = a^{m-n}$$

$$c^2 = a^2 + b^2$$

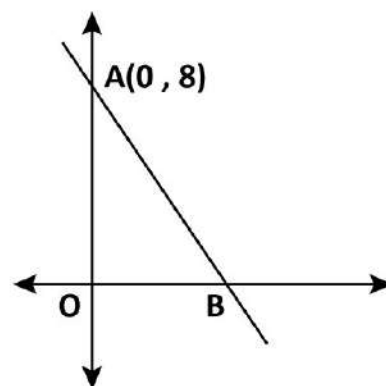
$$c^2 = a^2 + b^2$$



Q2: Answer The Following

- 1 If $(x + 3, 8) = (5, 2y)$, then find the value of x and y .

- 2 In the opposite figure:
If the area of triangle OAB is 20 squared units.
Find the slope of the straight line AB.



- 3 Find the solution set for each of the following inequalities in R :

a $2x + 3 < 6$

b $5 - 3x \geq 2$

c $11 > 3x + 2 > -4$

d $-8 \leq 4 - 3(x + 1) < 10$

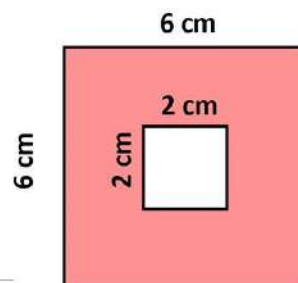
- 4 If the quantities a, b, c and d are proportional, prove each of the following:

$$\frac{4b + 7d}{4b + 7c} = \frac{5b - 8d}{5b - 8c}$$



5 In the board in front of you; if a person throws an arrow at the board, it hits:

- a Find the probability of hitting the shaded area.
- b If 360 people each throw an arrow, what is the expected number of times the shaded area will be hit

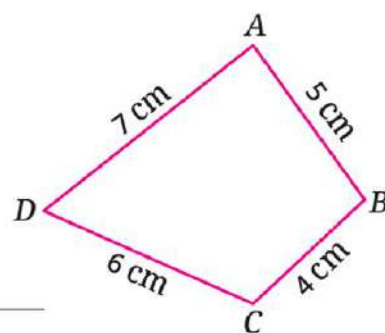


6 If R is a relation from X to Y and $R = \{(2, 2), (0, 2), (3, 1), (4, 2)\}$

- a Write the relation in a table form.
- b Represent the relation graphically.
- c Find the domain and the range of the relation

7 In the given figure:

ABCD is a quadrilateral in which
 $AB = 5 \text{ cm}$, $BC = 4 \text{ cm}$, $CD = 6 \text{ cm}$, $DA = 7 \text{ cm}$
 Prove that: $m(\angle ABC) > m(\angle ADC)$



8 If $X \times Y = \{(2, 3), (2, 6), (2, 7)\}$, Find:

- a X and Y.
- b Y^2
- c $n(X^2)$



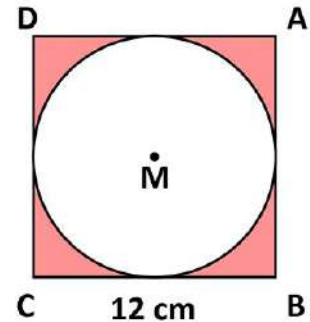
$$(x+y)^2 - (x-y)^2$$



$$\frac{a^m}{a^n} = a^{m-n}$$

$$c^2 = a^2 + b^2$$

- 9 Circle M touches the sides of square ABCD from the inside, where $AD = 12$ cm. ($\pi \approx 3.14$)
Find the circumference and area of the shaded region.

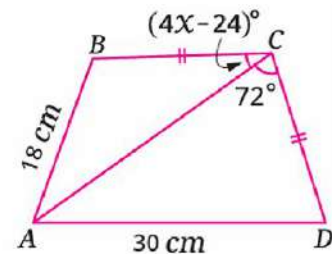


- 10 If the quantities a , b , c and d are proportional, prove each of the following:

$$\frac{a+b}{b} = \frac{c+d}{d}$$

- 11 If $X = \{0, 1, 2, 3\}$, $Y = \{6, 7, 8, 9, 10\}$ and R is a relation from X to Y where " xRy " means " $x+y = 10$ " for every $x \in X$, $y \in Y$ write the relation as a set of ordered pairs, then represent the relation with an arrow diagram stating the domain and the range of the relation. Does the relation represent a function or not? why?

- 12 Find the value of x :



- 13 If $X = \{1, 2\}$, $Y = \{2, 3, 4\}$, find:

a) $(X \cap Y) \times X$

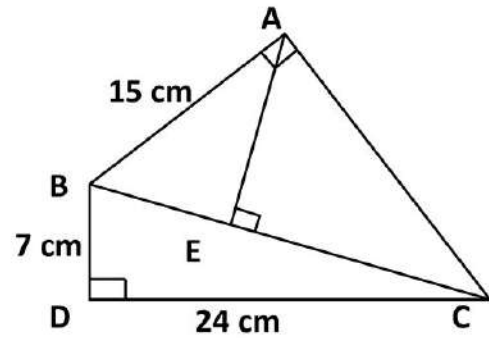
b) $(X - Y) \times Y$

c) $n(X^2)$



14 In the opposite figure:

ABC is a right-angled triangle at A ,
BDC is a right-angled triangle at D,
 $AE \perp BC$. Find: BC , AC , AE

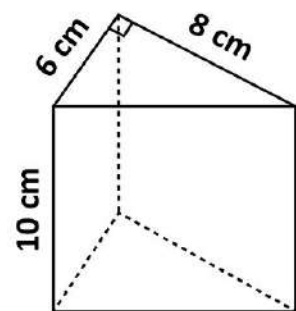


15 If $\frac{x}{3} = \frac{y}{4} = \frac{z}{5}$, find the value of: $\frac{x-y+z}{2x+y}$.

16 If $f(x) = 2x + 3$ and $f(k) = 11$, find the value of k

17 In the figure opposite:

A right triangular prism with a height of 10 cm
and a base that is a right triangle, with the lengths
of the legs being: 6 cm, 8 cm.
Find The lateral area of the prism.



18 Find the value of x if the numbers x, 24 and 144 are proportional.



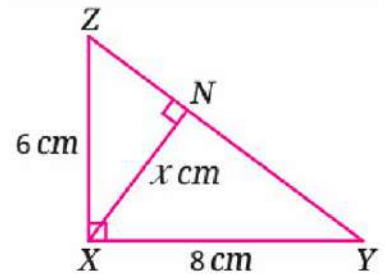
$$(x+y)^2 - (x-y)^2$$



$$\frac{a^m}{a^n} = a^{m-n}$$

$$c^2 = a^2 + b^2$$

19 Find the value of x:



20 Find the value of x and y to make the quantities x , 6 , 12 , y are in continued proportion.

21 If $X = \{2, 1, 0, -1, -2\}$, and R is a relation on X, where aRb means (a is the additive inverse of b) for every $a, b \in X$.
Write the relation R and represent it with a Cartesian diagram.

22 If $\frac{x}{2} = \frac{y}{4} = \frac{z}{5}$, and $x + y - 2z = 12$ Find the value of z

23 If the straight line which represents the function $f(x) = ax + b$ intersects X-axis at (3 , 0) and Y-axis at (0 , -3), find the value of a and b

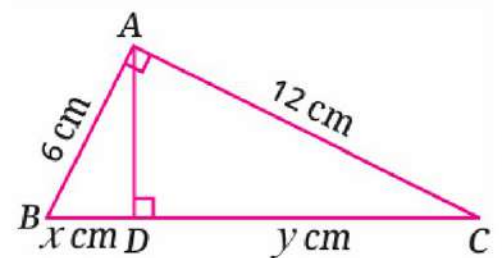
24 Find the number that if added to the two terms of the ratio 7 : 11 it becomes 2 : 3



- 25** A right quadrilateral prism has a square base with a side length of 8 cm and a height of 10 cm. Find the volume of the prism, its total area.

- 26** If $X = \{1, 3, 5\}$ and R is a function on X , and relation R is $\{(a, 3), (b, 1), (1, 5)\}$. Find:
- a** The range of the function
 - b** The numerical value of the expression: $a + b$

- 27** In the given figure:
What is the value of $\frac{x}{y}$?



- 28** The mean proportional between the numbers 3 and 48 equals.....

- 29** If $x = \{1, 3, 4, 5\}$, $y = \{1, 2, 3, 4, 5, 6\}$ and R is a relation from X to Y where " aRb " means " $a + b = 7$ " for each $a \in X$, $b \in Y$
- a** Write R and represent it with an arrow diagram.
 - b** Show if R is a function or not, and why? If it is a function, find its range.

- 30** If $(x - 2, 9) = (5, x + y)$, Find $\sqrt{3x + 2y}$

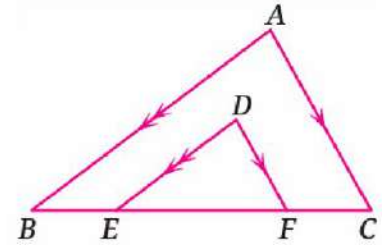


31 In the given figure:

If $AC < AB$

Prove that:

$DE > DF$



32 If the slope of the line passing through the two points $(a, -11)$ and $(2a + 9, 3)$ is 7, find the value of a .

33 If $f(x) = x + m$ and the point $(1, 8)$ lies on the straight line which represents the function f . Find the value of $m, f(3)$.

34 If $X = \{-2, -1, 0, 1, 2\}$, and R is a relation from X to X where " $a R b$ " means " $a + b = 0$ " for every $a \in X$ and $b \in X$

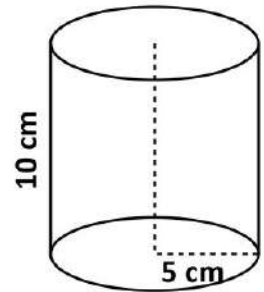
- a** Write R as a set of ordered pairs.
- b** Represent the relation using an arrow diagram.
- c** Find the domain and the range of the relation.
- d** Does the relation represent a function or not? why?

35 If the straight line for the function $f: \mathbb{R} \rightarrow \mathbb{R}$ where $f(x) = 6x - a$ cuts Y-axis at the point $(b, 3)$. Find the value of $2a + 7b$.



37 In the figure opposite:

A right circular cylinder with a radius of 5 cm and a height of 10 cm. Find: The volume of the cylinder.



38 If $A = \{1, 7, 9\}$; $B = \{4, 2, 7\}$; $C = \{1, 7\}$; then:

- a) $A \times C$ and represent it using an arrow diagram.
- b) $B \times (A \cup C)$

39 If b is the middle proportional between a and c , Prove that: $\frac{3a + 4b}{3b + 4c} = \frac{a}{b}$

40 Represent graphically the function f where $f(x) = 3x - 1$

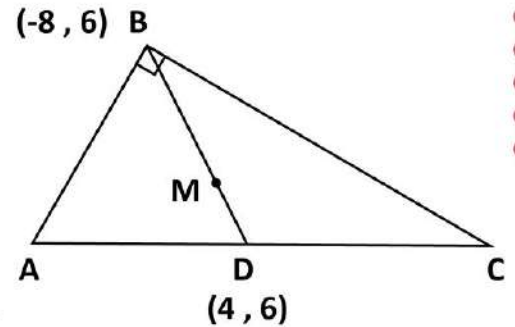
41 Find the S.S. in R for the following inequality and represent it on the number line:

$$2 \leq 3x - 1 \leq 14$$

42 Find the value of x that makes the following numbers are proportional: $x, 20, 30, 60$



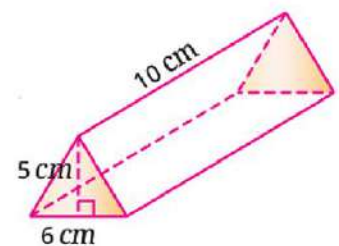
- 43** In the opposite figure,
M is the intersection point of the medians
of triangle ABC.
Find AC.



- 44** If $\frac{x-2y}{x+3y} = \frac{1}{3}$, Find the value of $\frac{y}{x}$

- 45** If b is the middle proportional between a and c, Prove that: $\frac{a^2 + b^2}{b^2 + c^2} = \frac{a}{c}$

- 46** In the given figure:
Find the volume of the prism



- 47** If $f(x) = 2x^2 - 5x + 2$, prove that $f(2) = f\left(\frac{1}{2}\right)$

- 48** Find the number that if added to the numbers 3, 5, 9, and 13 it becomes proportional.



$$(x+y)^2 - (x-y)^2$$



$$\frac{a^m}{a^n} = a^{m-n}$$

$$c^2 = a^2 + b^2$$

2nd term

2nd Prep

$$c^2 = a^2 + b^2$$

49 Find the S.S. of the following inequality in R and represent it on the number line:

$$3 - 4x \geq 15$$

50 Find the solution set of the inequality: $-3 < 2x + 5 < 13$ in R .

51 Find the value of x, y if the quantities 2, x, y and 54 are in a continued proportion.

52 If $X = \{1, 3, 7\}$, $Y = \{5, 9\}$, find $X \times Y$, Y^2



Q1: Choose the correct answer

1 If $(a + 5, 3) = (8, b - 1)$ then $\sqrt{a^2 + b^2}$

(a) 7

(b) 3

(c) 9

(d) 5

2 If $n(X^2) = 9$ and $n(X \times Y) = 6$, then $n(Y^2) = \dots\dots\dots$

(a) 2

(b) 3

(c) 4

(d) 8

3 If $n(X^2) = 9$, then $n(X) = \dots\dots\dots$

(a) 3

(b) ± 3

(c) 9

(d) ± 9

4 The projection of a point on a given straight line is

(a) a point

(b) a line segment

(c) a ray

(d) a straight line

5 If $\frac{x}{5} = \frac{y}{4} = \frac{x + 2y}{k}$, then $k = \dots\dots\dots$

(a) 9

(b) 13

(c) 14

(d) 8

6 The positive middle proportional between a and b is

(a) $\sqrt{ab}$

(b) $-\sqrt{ab}$

(c) $\pm\sqrt{ab}$

(d) ab

7 The third proportional of 9 and -12 is

(a) -16

(b) 8

(c) 16

(d) 108

8 The interval $[-1, 2[$ is the solution set in $\mathbb{R}$ for the inequality:

(a) $-1 < x < 2$

(b) $-1 < x \leq 2$

(c) $-1 \leq x < 2$

(d) $-1 \leq x \leq 2$

9 One of the advantages of sampling is

(a) accuracy

(b) comprehensiveness

(c) complete representation of all population members

(d) saving time and effort



- 10 If $f(x) = x^2$, $g(x) = x + 4$, what is the value of $5f(2) + 2g(5)$?
- (a) 18 (b) 20 (c) 38 (d) 70
- 11 If $(a, a) \in f$ where $f(x) = 2x + 3$, then $a = \dots\dots\dots$
- (a) 3 (b) -3 (c) 0 (d) 1
- 12 If R is a relation where $R = \{(1, 7), (2, 8), (3, 7), (5, 8)\}$, Then the range = $\dots\dots\dots$
- (a) $\{1, 2, 3, 5\}$ (b) $\{7, 8, 5\}$ (c) $\{7, 8\}$ (d) $\{1, 2, 7, 8\}$
- 13 If $(x, 7)$ is located on Y-axis, then $5x + 1 = \dots\dots\dots$
- (a) 0 (b) 1 (c) 5 (d) 6
- 14 If $(k^2 - 4, k)$ lies on the negative direction of Y-axis, then $k = \dots\dots\dots$
- (a) 2 (b) ± 2 (c) -2 (d) 0
- 15 If the lateral area of a right circular cylinder equals $2\pi r^2 \text{ cm}^2$, what is its height?
- (a) $\frac{1}{2}r \text{ cm}$ (b) $\frac{3}{4}r \text{ cm}$ (c) $r \text{ cm}$ (d) $2r \text{ cm}$
- 16 If $f(x) = 3$, then $f(-5) - f(5) = \dots\dots\dots$
- (a) 6 (b) 1 (c) zero (d) -1
- 17 The distance between the point $(-5, -2)$ and the y-axis is $\dots\dots\dots$ length unit.
- (a) -5 (b) -2 (c) 2 (d) 5
- 18 In triangle ABC, If $AB = 3 \text{ cm}$, and $BC = 5 \text{ cm}$, then $AC \in \dots\dots\dots$
- (a) $]3, 8]$ (b) $[2, 8]$ (c) $]2, 8[$ (d) $]2, 5[$
- 19 If $n(X \times Y) = 6$ and $Y = \{2\}$, then $n(X^2) = \dots\dots\dots$
- (a) 4 (b) 9 (c) 16 (d) 36



20 What is the S.S. for the inequality: $5x \leq 25$ in $\mathbb{R}$?

- (a) $]-\infty, 5[$ (b) $]5, \infty[$ (c) $[5, \infty[$ (d) $]-\infty, 5]$

21 If $f(x) = 4$, then $f(4) \div f(10) = \dots\dots\dots$

- (a) 4 (b) $\frac{2}{5}$ (c) 1 (d) 10

22 If $R = \{(1,3), (2,5), (4,3)\}$ represent a function, then its domain = $\dots\dots\dots$

- (a) $\{1, 2, 4\}$ (b) $\{3, 5, 4\}$ (c) $\mathbb{Z}$ (d) $\mathbb{N}$

23 What is the area of the circle whose radius length is 10 m?

- (a) $5\pi \text{ m}^2$ (b) $10\pi \text{ m}^2$ (c) $25\pi \text{ m}^2$ (d) $100\pi \text{ m}^2$

24 What is the diameter of a circle whose area = 36π square inches?

- (a) 6 inches (b) 12 inches (c) 18 inches (d) 36 inches

25 If 6 is the middle proportional between m and 2, then $m = \dots\dots\dots$

- (a) 8 (b) 12 (c) 18 (d) 36

26 If $\frac{a}{b} = \frac{b}{c} = \frac{c}{5} = 2$, then $a = \dots\dots\dots$

- (a) 5×2^2 (b) 40 (c) 10 (d) 2×5^3

27 If $a, 2, 4, b$ are in a continued proportional, then $a + b = \dots\dots\dots$

- (a) 1 (b) 8 (c) 7 (d) 9

28 What is the distance of the point $A(-3, 4)$ from the origin?

- (a) 3 units (b) 4 units (c) 5 units (d) 7 units

29 If $X = \{3, 4\}$, then $n(X \times \emptyset) = \dots\dots\dots$

- (a) 0 (b) 1 (c) 2 (d) $\emptyset$



30 $f(x) = 3x$ is represented by a straight line passes through the point

- (a) (3, 3) (b) (3, 0) (c) (0, 0) (d) (0, 3)

31 If $f(x) = 5$, then $f(-3) = \dots\dots\dots$

- (a) 5 (b) -5 (c) -3 (d) -15

32 If (a, 3) lies on the straight line that represents $f(x) = 2x - 5$, then a =

- (a) 2 (b) 1 (c) -2 (d) 4

33 If $f(x) = 3x + b$ and $f(4) = 13$, then b =

- (a) 1 (b) 2 (c) 0 (d) 3

34 If the point (k, 5) lies on the straight line representing the function f where $f(x) = 2x - 7$, what is the value of k ?

- (a) 3 (b) 4 (c) 5 (d) 6

35 In any circle, what is the value of $\frac{C}{d}$?

- (a) $\frac{\pi}{2}$ (b) π (c) 2π (d) $\frac{2}{\pi}$

36 If x, 4, y, 5 are proportional quantities, then $x : y = \dots\dots\dots$

- (a) 4 : 5 (b) 5 : 4 (c) 4 : 1 (d) 5 : 1

37 A right quadrilateral prism whose base is in the shape of a square with side length 10 cm. If the height of the prism is 8 cm, What is its volume

- (a) 80 cm^3 (b) 160 cm^3 (c) 320 cm^3 (d) 800 cm^3

38 If $\frac{x}{5} = \frac{y}{4} = \frac{x+2y}{k}$, then k =

- (a) 9 (b) 14 (c) 13 (d) 8



39 What's the third proportional for x^4 , $2x^3$?

☐ a $2x^2$

☐ b $2x$

☐ c $4x^3$

☒ d $4x^2$

40 If: $3a = 5b = 4c$, then $a : b : c$ equals

☐ a $9 : 12 : 16$

☒ b $20 : 12 : 15$

☐ c $15 : 10 : 9$

☐ d $8 : 5 : 3$

41 Which of the following relations is represented by a straight line parallel to the x-axis ?

☒ a $2y = 6$

☐ b $2x = 6$

☐ c $x = -y$

☐ d $x - y = 0$

42 If the point $(a, 5) \in Y$ -axis, then $a = \dots\dots\dots$

☒ a 0

☐ b 5

☐ c -5

☐ d 25

43 If $\{2\} \times \{x, y\} = \{(2, 4), (2, 3)\}$, then $x - y = \dots\dots\dots$

☐ a 1

☐ b -1

☒ c ± 1

☐ d 0

44 If the point $(3, b - 5)$ lies on the x-axis, then $2b + 1 = \dots\dots\dots$

☐ a Zero

☐ b 5

☒ c 11

☐ d 8

45 What is the S.S. for the inequality: $3 \geq x > -3$ in R ?

☐ a $] -3, 3[$

☒ b $] -3, 3]$

☐ c $[-3, 3[$

☐ d $[-3, 3]$

46 What is the solution set of the inequality $-x > 3$ in R ?

☒ a $] -\infty, -3[$

☐ b $] -\infty, 3[$

☐ c $] -3, \infty[$

☐ d $] 3, \infty[$

47 If the straight line representing the function f where $f(x) = kx + 4$ passes through the point $(1, 1)$, what is the value of $f(-1)$?

☐ a -7

☐ b -1

☐ c 1

☒ d 7



48 The distance between the point $(\sqrt{3}, 1)$ and the origin point is

- (a) 4 (b) 3 (c) 2 (d) 1

49 If $n(X) = 2$ and $Y = \{1, 2\}$, then $n(X \times Y) = \dots\dots\dots$

- (a) 4 (b) 3 (c) 5 (d) 6

50 If $(3, 5) \in \{(3, x), (3, 8), (6, 8)\}$, then $X = \dots\dots\dots$

- (a) 8 (b) 3 (c) 5 (d) 6

51 If $X = \{1, 2\}$ and $Y = \{3, 4\}$, then $(3, 4) \in \dots\dots\dots$

- (a) $X \times Y$ (b) $Y \times X$ (c) X^2 (d) Y^2

52 If $X = \{2\}$ and $Y = \{3\}$, then $X \times Y = \dots\dots\dots$

- (a) 6 (b) $\{6\}$ (c) $(2, 3)$ (d) $\{(2, 3)\}$

53 In ΔABC , if $AB < AC$, then $m(\angle B) \dots\dots\dots m(\angle C)$

- (a) $>$ (b) $=$ (c) $<$ (d) $\leq$

54 The middle proportional between 5 and 20 is

- (a) 10 (b) -10 (c) 100 (d) ± 10

55 The middle proportional between $(x - 2)$ and $(x + 2)$ is

- (a) $\sqrt{x + 2}$ (b) $\sqrt{x^2 - 4}$ (c) $x^2 - 4$ (d) $\pm \sqrt{x^2 - 4}$

56 If $a, 3, 9, b$ are continued proportional quantities, find the value of: $b + a = \dots\dots\dots$

- (a) 3 (b) 9 (c) 27 (d) 28

57 If $\frac{a}{5} = \frac{b}{7}$, then $7a - 5b + 3 = \dots\dots\dots$

- (a) 3 (b) 7 (c) 5 (d) 2



58 If a , x , b and $2x$ are proportional quantities, then $a : b = \dots\dots\dots$

☒ a) 1 : 2

☐ b) 2 : 1

☐ c) 1 : 3

☐ d) 1 : 4

59 If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 2$, then the value of $\frac{a+d}{d} = \dots\dots\dots$

☐ a) 5

☐ b) 7

☐ c) 8

☒ d) 9

60 If $\frac{a}{b} = \frac{c}{d} = \frac{3}{5}$, then $\frac{a+c}{b+d} = \dots\dots\dots$

☐ a) $\frac{5}{3}$

☒ b) $\frac{3}{5}$

☐ c) $\frac{6}{5}$

☐ d) $\frac{5}{6}$

61 If a is the first proportional for the numbers 4 and 16, what is the value of a ?

☒ a) 1

☐ b) 2

☐ c) 4

☐ d) 8

62 What is the fourth proportional for the quantities 2, 4, 5?

☐ a) 12

☒ b) 10

☐ c) 3

☐ d) 6

63 If the straight line that represents the function $f(x) = 2x - a$ passes through the origin, then $a = \dots\dots\dots$

☐ a) -3

☐ b) 2

☒ c) 0

☐ d) 3

64 What is the solution set of the inequality $5 > -x > -3$ in $\mathbb{R}$?

☐ a) $[-5, 3]$

☒ b) $] -5, 3 [$

☐ c) $[-3, 5]$

☐ d) $] -3, 5 [$

65 If a , b , 2, 3 are proportional, then $\frac{b}{a} = \dots\dots\dots$

☒ a) $\frac{3}{2}$

☐ b) $\frac{2}{3}$

☐ c) 3

☐ d) 2

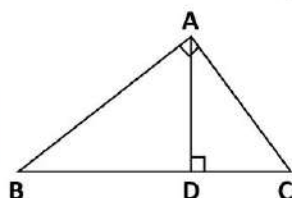
66 In the given figure, which of the following is correct?

☐ a) $(AB)^2 = BD \times DC$

☐ b) $(AB)^2 = BC \times AC$

☒ c) $(AB)^2 = BD \times BC$

☐ d) $(AB)^2 = BC \times DC$



67 Which of the following Cartesian product does the point $(\frac{1}{5}, \sqrt{5})$ belong to?

- (a) $N \times N$ (b) $Z \times Z$ (c) $Q \times Q$ (d) $R \times R$

68 If X, Y are two sets where $n(X \times Y) = 11$, then $n(X) + n(Y) = \dots\dots\dots$

- (a) 8 (b) 9 (c) 11 (d) 12

69 If $X = \{5, 7, 8\}$, $Y = \{9, 10\}$ and R is a function from X to Y where:
 $R = \{(5, 9), (8, 9), (k, 9)\}$, what is the value of k ?

- (a) 5 (b) 7 (c) 8 (d) 9

70 The ordered pair $(1, 2)$ belongs to the function f where: $\dots\dots\dots$

- (a) $f(x) = 2x - 1$ (b) $f(x) = -3x + 7$ (c) $f(x) = 2x + 1$ (d) $f(x) = -3x + 5$

71 The straight line representing the function f where $f(x) = 3x - 12$ cuts the x -axis at the point:

- (a) $(-12, 0)$ (b) $(12, 0)$ (c) $(4, 0)$ (d) $(-4, 0)$

72 A right circular cylinder has volume $= 40\pi \text{ cm}^3$ and height $= 10 \text{ cm}$.
Its base radius $= \dots\dots\dots$

- (a) 1 cm (b) 2 cm (c) 3 cm (d) 4 cm

73 If $4x^2 = 9y^2$, then $\frac{x}{y} = \dots\dots\dots$

- (a) $\frac{9}{4}$ (b) $\frac{3}{2}$ (c) $\pm \frac{3}{2}$ (d) $\pm \frac{2}{3}$

74 Which of the following is a secondary source for collecting data?

- (a) Personal interview (b) Questionnaires
(c) Employee database (d) Observation and measurement



75 The areas of two circles are 64π , 100π , what is the ratio between their circumferences?

☐ a 3 : 4

☒ b 4 : 5

☐ c 9 : 16

☐ d 16 : 25

76 What is the slope of the straight line passing through the two points

A (-2, 3), B (5, 7)?

☐ a $\frac{7}{4}$

☒ b $\frac{4}{7}$

☐ c $\frac{4}{3}$

☐ d $\frac{2}{3}$

77 If $\frac{4}{x} = \frac{7}{y} = \frac{b}{y-x}$, then b =

☒ a 3

☐ b -3

☐ c 11

☐ d -11

78 If $\frac{a}{b} = \frac{c}{d} = k$ where $k \neq 0$, then $\frac{a \times c}{b \times d} = \dots\dots\dots$

☐ a $2k^2$

☒ b k^2

☐ c k

☐ d 2k

79 The circumference of a circle is 10π cm, what is its area ?

☒ a $25\pi \text{ cm}^2$

☐ b $50\pi \text{ cm}^2$

☐ c $75\pi \text{ cm}^2$

☐ d $100\pi \text{ cm}^2$

80 A hospital has 40 doctors, 200 nurses, a layer sample of size 36 individuals was taken in which each layer is represented according to its size, then the number of nurses in this sample equals nurses?

☐ a 6

☐ b 18

☐ c 24

☒ d 30

81 If $5a - 4b = 0$, then $\frac{a}{b} = \dots\dots\dots$

☒ a $\frac{4}{5}$

☐ b $\frac{5}{4}$

☐ c $\frac{-4}{5}$

☐ d $\frac{-5}{4}$

82 A right pentagonal prism whose height is 8 cm, and its volume is 168 cm^3 , what is its base area?

☐ a $1,344 \text{ cm}^2$

☐ b 176 cm^2

☒ c 21 cm^2

☐ d 18 cm^2



83 In a mixed school with 1,200 students, a random sample of 90 students was chosen, and it was found that the number of girls is 54, what is the expected number of girls in the school?

- (a) 480 girls (b) 660 girls (c) 720 girls (d) 840 girls

84 If $f(x + 3) = x - 3$, then $f(7) = \dots\dots\dots$

- (a) 4 (b) 1 (c) 7 (d) 10

85 The number that must be added to the numbers 1,3,6 to be in a continued proportional is

- (a) 1 (b) 2 (c) 3 (d) 4

86 What is the area of the circle whose center is the point A $(-3, 5)$, and passes through the point B $(9, -4)$?

- (a) 15π sq units (b) 225π sq units (c) 13π sq units (d) 144π sq units

87 A right pentagonal prism whose base is a regular pentagon with area 10 m^2 , and the area of one of its lateral rectangles is 9 m^2 , what is the total area of the prism?

- (a) 19 m^2 (b) 38 m^2 (c) 55 m^2 (d) 65 m^2

88 If $f(x) = kx + 8$ and $f(2) = 0$, then $k = \dots\dots\dots$

- (a) 8 (b) 6 (c) 4 (d) -4



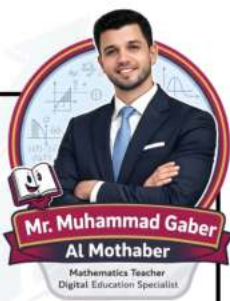
حمل الآن

مجاناً وحصرياً

المراجعة رقم (3)

الترم الثاني




Question 1 Choose the correct answer

1 The mean proportional between the two numbers 4 , 9 is

- (a) ± 12 (b) ± 8 (c) ± 6 (d) ± 36

2 If $\frac{x}{3} = \frac{y}{4} = \frac{x+2y}{k}$, then k =

- (a) 7 (b) 10 (c) 11 (d) 12

3 If $8a = 2b$, then $\frac{a}{b} = \dots\dots\dots$

- (a) 4 (b) 2 (c) $\frac{1}{2}$ (d) $\frac{1}{4}$

4 If $\frac{a}{b} = \frac{3}{4}$, so what is the value of $4a - 3b + 7 = \dots\dots\dots$

- (a) 3 (b) 4 (c) 7 (d) 8

5 If $\frac{3}{m} = \frac{7}{n}$, $n - m = 20$, so what is the value of m =

- (a) 4 (b) 12 (c) 15 (d) 35

6 If $\frac{a}{b} = \frac{b}{c}$, then $\frac{a}{c} = \dots\dots\dots$

- (a) b^2 (b) $\frac{a+b}{b+c}$ (c) $\frac{a^2}{b^2}$ (d) $\frac{ac}{b^2}$

7 If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = \frac{1}{4}$, so what is the value of $\frac{a+b+c}{b+c+d} = \dots\dots\dots$

- (a) $\frac{1}{8}$ (b) $\frac{1}{64}$ (c) $\frac{1}{4}$ (d) $\frac{3}{4}$

8 If $2a = 3b = 4c$, then a : b : c equals

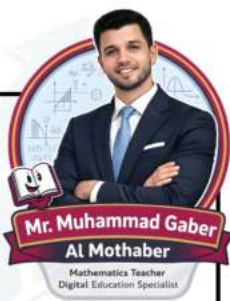
- (a) 3 : 4 : 6 (b) 6 : 4 : 3 (c) 2 : 3 : 4 (d) 2 : 3 : 6

9 If $x, 8, x^2$ are in proportion, then $x = \dots\dots\dots$

- (a) 4 (b) 8 (c) $8x^3$ (d) x^3



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10 What is the solution set of the inequality : $1 < 3 - 2X < 11$ in $\mathbb{R}$?

- (a) $]1, 4[$ (b) $] -4, 1[$ (c) $] -4, 1[$ (d) $] -4, 1[$

11 If $-4 < 2X \leq 8$, then $X \in \dots\dots\dots$

- (a) $] -2, 4[$ (b) $] -2, 4[$ (c) $] -2, 4[$ (d) $] -2, 4[$

12 What is the solution set of the equation $3(3X+4)=2X-16$ in $\mathbb{R}$?

- (a) $\{4\}$ (b) $\{-4\}$ (c) $\{3\}$ (d) $\{-3\}$

13 If $f(X)=3$, What is the value of: $\frac{f(9)}{f(6)}$?

- (a) $\frac{3}{2}$ (b) $\frac{2}{3}$ (c) 1 (d) 3

14 If $f(X) = X - 2$, What is the value of : $f(0) + f(4)$?

- (a) 0 (b) 2 (c) 4 (d) 6

15 What is the domain of the relation $\{(1, 3), (2, 3), (3, 4), (4, 4)\}$?

- (a) $\{3,4\}$ (b) $\{3,4\}$ (c) $\{1,2,3,4\}$ (d) $\{1,2\}$

16 If $n(X \times Y)=20$, $n(X^2)=16$, then $n(Y^2) = \dots\dots\dots$

- (a) 4 (b) 9 (c) 5 (d) 25

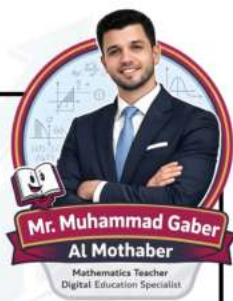
17 If $X=\{1, 2\}$, $Y=\{6, 4\}$, then $(6, 4) \in \dots\dots\dots$

- (a) $X \times Y$ (b) $Y \times X$ (c) X^2 (d) Y^2

18 If $(X+2,y)=(2,3)$, What is the value of: $X^5y + 1$?

- (a) 3 (b) 2 (c) 1 (d) 0



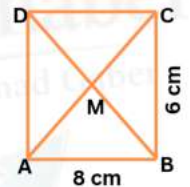


- 19 In the given figure: If the volume of the right triangular prism equals 36cm^3 . What is the value of h ?



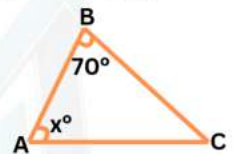
- (a) 6 (b) 8 (c) 10 (d) 12

- 20 In the given figure: ABCD is a rectangle. What is the length of the projection of $\overline{MC}$ on $\overleftrightarrow{CB}$?



- (a) 5 cm (b) 3 cm (c) 4 cm (d) 6 cm

- 21 In the given figure: What is the inequality that expresses the values of x that makes $BC > BA$?



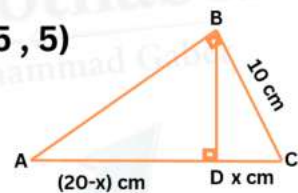
- (a) $70 < x < 180$ (b) $55 < x < 110$ (c) $55 < x < 180$ (d) $0 < x < 55$

- 22 If the point $A(-3,4)$ is on a circle whose center is $O(0,0)$, which of the following points lies on the circle O ?

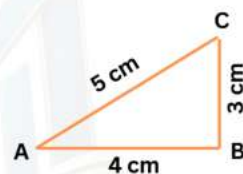
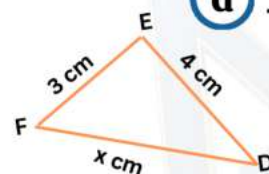
- (a) $(0, 4)$ (b) $(-3, 0)$ (c) $(-5, 0)$ (d) $(5, 5)$

- 23 In the given figure : What is the value of X ?

- (a) 2 (b) 3 (c) 5 (d) 10



- 24 In the given figure: What are the values of X that make $m(\angle E) > m(\angle B)$?

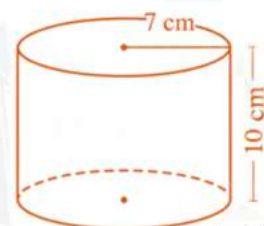


- (a) $3 < X < 4$ (b) $5 < X < 7$ (c) $5 < X$ (d) $X > 7$

- 25 If $A(2,3), B(-1,k), k < 0$ what is the value of k that makes the length of $\overline{AB}$ equals 5cm?

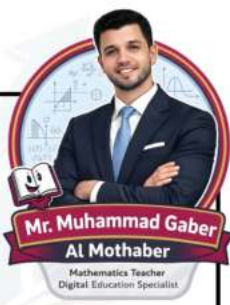
- (a) -1 (b) -3 (c) -7 (d) -5

- 26 In the given figure: What is the lateral surface area of the right circular cylinder? where $(\pi \approx \frac{22}{7})$

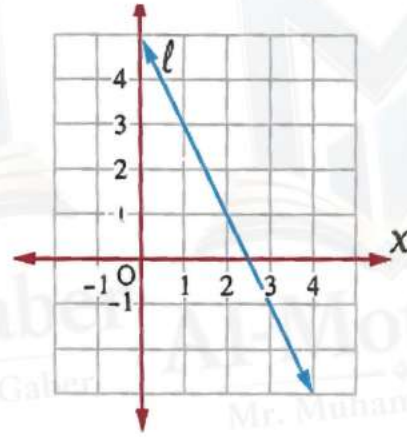


- (a) 1540cm^2 (b) 440cm^2
(c) 70cm^2 (d) 490cm^2





- 27 In the given figure:
What is the slope of the straight line l ?



- (a) 2 (b) -2
(c) $-\frac{1}{2}$ (d) $\frac{1}{2}$
- 28 A basketball player attempted 45 shots during practice and successfully scored 35 times. If he shoots 36 times in a game then the expected number of times he successfully scores a basket is
- (a) 27 (b) 28 (c) 30 (d) 26

- 29 In job applicants test at one institutions, 30 people applied. If 25 passed the foreign language test, 22 passed the computer test and 20 passed both tests. If one person is chosen randomly, which of the following has a probability of $\frac{1}{6}$?

- (a) Passing the computer test only.
(b) Passing the foreign language test only.
(c) Failing at least one of the two tests.
(d) Passing the one of the two tests but not the other.

- 30 Sample method is not used to collect data in the case of

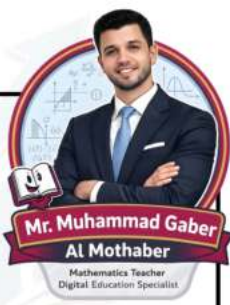
- (a) a blood test of a patient. (b) examining a factory production.
(c) elections. (d) examining a test of soil suitability for agriculture.

- 31 Selecting specific individuals from the statistical population that fits the research objectives is

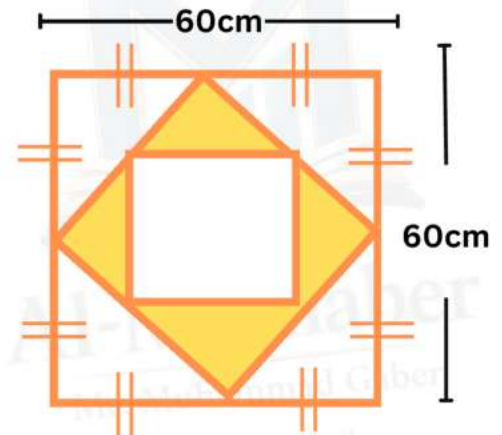
- (a) a simple random sample. (b) a layer random sample.
(c) a biased sample. (d) random selection.



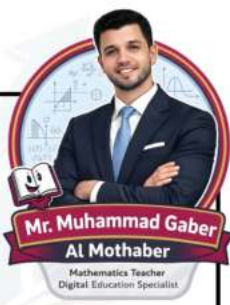
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- 32** An institution has 150 employees, 35 heads of department, 15 managers. A layer sample of 40 members was selected to represent the three layers in the institution, so the number of heads of department in the sample =
- (a) 15 (b) 35 (c) 30 (d) 7
- 33** All of the following are of the same type of data sources except
- (a) the internet. (b) media. (c) surveys. (d) employee files.
- 34** A factory produces 450 units of a certain product daily and operates throughout the week. If the expected number of defective units in a week is 210 units and one of the produced units is randomly selected then the probability that it is non-defective is equals
- (a) $\frac{7}{15}$ (b) $\frac{8}{15}$ (c) $\frac{1}{15}$ (d) $\frac{14}{15}$
- 35** If the shooter hits the board 20 times, what is the expected number of hitting on the colored part?
- (a) 10 (b) 15
(c) 5 (d) 12
- 36** One of the disadvantages of secondary sources for data collection
- (a) it require long time. (b) it requires a high cost.
(c) it is not accurate. (d) it requires a larger number of researchers.



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37 The fourth proportional for the 2, 6, 9 is -----

- (a) 12 (b) 18 (c) 27 (d) 54

38 A is the first proportional for the two numbers 4, 16. What is the value of A ?

- (a) 8 (b) 2 (c) 4 (d) 1

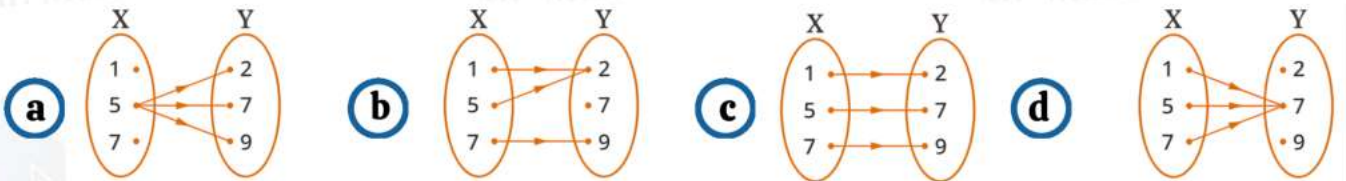
39 If $a : b = b : c$, then $a^4 : b^4$ equals

- (a) $ac : b^2$ (b) $a^2 : c^2$ (c) $c^2 : a^2$ (d) $b^2 : ac$

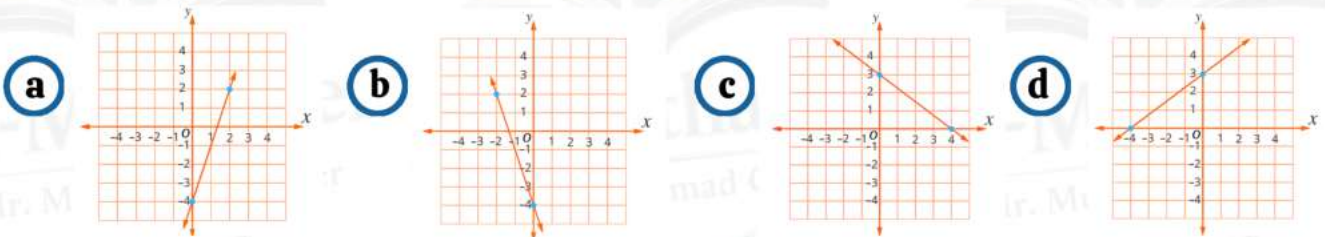
40 If : $n(X) = 5, n(X \times Y) = 15$, then $n(Y) =$ -----

- (a) 15 (b) 1 (c) 5 (d) 3

41 Which of the following relations is not a function from X to Y ?



42 Which of the following figures is considered a graphical representation of the function f , where $f(X) = 3X - 4$?



43 If (a, a) belongs to the function f , where $f(X) = 2X + 3$, then $a =$

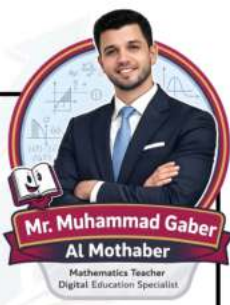
- (a) 2 (b) 3 (c) -3 (d) -2

44 The domain of the function $\{ (1,2), (2,3), (4,2), (5,3) \}$ is

- (a) $\{2, 3\}$ (c) $\{1, 2, 5, 4\}$
(b) $\{2, 3, 4, 5\}$ (d) $\{1, 2, 3, 4\}$

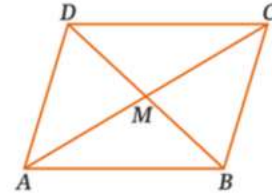


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45 ABCD is a parallelogram , $AC > BD$

Which of the following statements is true ?

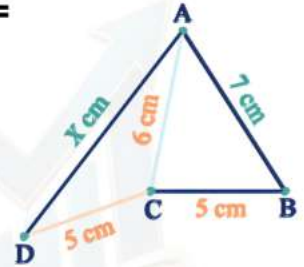


- (a) $MC < MD$ (b) $MC < MB$ (c) $MC > MB$ (d) $MC = MD$

46 In $\triangle XYZ$: If $m(\angle X) = 110^\circ$, $m(\angle Y) = 40^\circ$, then : $XY \dots\dots\dots XZ$

- (a) $>$ (b) $<$ (c) $//$ (d) $=$

47 What is the possible values of x that satisfy that :
 $m(\angle ACD) > m(\angle ACB)$?



- (a) $7 < x < 11$ (b) $x > 6$ (c) $4 < x < 11$ (d) $x < 7$

48 If the triangle ABC is right-angled at A, $AB = AC = 8$ cm, $AD \perp BC$,
 $D \in \overline{BC}$, What is the length of $\overline{AD}$?

- (a) $8\sqrt{2}$ cm (b) 8 cm (c) $4\sqrt{2}$ cm (d) 4 cm

49 The circumference of a circle is 10π cm, what is its area?

- (a) 25π cm² (b) 75π cm² (c) 50π cm² (d) 100π cm²

50 A right circular cylinder whose volume is 320π cm³, and its height is 20 cm., what is the diameter length of its base ?

- (a) 2 cm (b) 4 cm (c) 16 cm (d) 8 cm

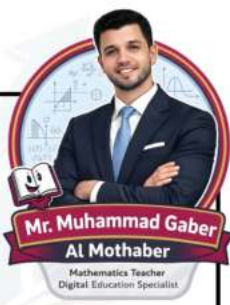
51 A prism with a square base of side length 7 cm and a height of 4 cm, then it has a lateral area ofcm²

- (a) 28 (b) 56 (c) 84 (d) 112

52 If the points (3, 1), (0,4), (1,k) are collinear, what is the value of k ?

- (a) 1 (b) -1 (c) 3 (d) -3





Question 2

Answer the following

- 1 If the quantities : 35, 15, 3, $2x + 1$ are proportional, then find the numerical value of x .

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- 2 If $\frac{a+b}{25} = \frac{a-b}{11} = \frac{a+b-c}{8}$, then find the ratio $a : b : c$

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- 3 Find the number which if subtracted from each of the numbers 6, 9, 15 they become proportional.

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- 4 If $x, y, 16$ are proportional, $x + y = 12$ find each of : x, y

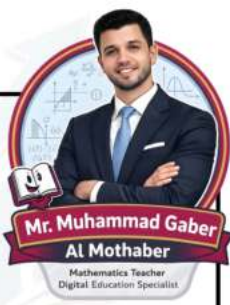
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5 If b is a mean proportional between a, c prove that :

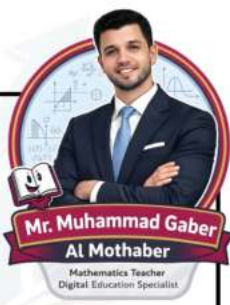
$$\frac{a^2}{b^2} + \frac{b^2}{c^2} = \frac{2a}{c}$$

6 If a, b, c, d are in continued proportion, prove that: $\frac{a^2 - 3c^2}{b^2 - 3d^2} = \frac{b}{d}$

7 If $\frac{x}{4} = \frac{y}{5} = \frac{z}{3}$, what is the value of: $\frac{x - y + z}{x + y - z}$



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8 Find the solution set of the equation:

$$3(\sqrt{2}x + 4) - 5 = 19 \text{ in } \mathbb{R}$$

9 If $X = \{1\}$, $Y = \{2, 3\}$, $Z = \{2, 5, 6\}$ Find each of the following:

a $X \times Z$

b Y^2

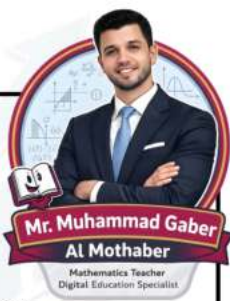
c $X \times (Y \cap Z)$

10 If the straight line representing the function $f : \mathbb{R} \rightarrow \mathbb{R}$ where $f(x) = 2x - 3k$ intersects the y-axis at the point $(3-m, 6)$ Find the values of: k, m

11 Represent graphically the function f where $f(x) = 3x - 1$



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- 12** If $X = \{0, 1, 2, 3\}$, $Y = \{0, -1, -2, -3\}$ and R is a relation from X to Y where " xRy " means that "the number x is the additive inverse of the number y " for each $x \in X, y \in Y$

a Write R as a set of ordered pairs, and represent it using arrow diagram.

b Is R a function? Why? And state its range if it is a function.

- 13** Find the solution set of the inequality: $-3 < 2x + 5 < 13$ in $\mathbb{R}$

- 14** If $X \times Y = \{(1, 2), (1, 5), (3, 2), (3, 5), (4, 2), (4, 5)\}$ Find each of the following:

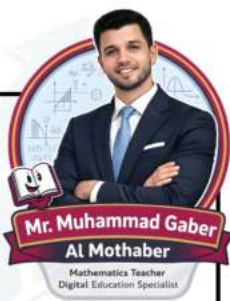
a $Y \times X$

b Y, X

c $n(X^2)$



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- 15 If $A(1, -1)$, $B(2, 2)$, $C(0, -4)$, prove that: $A \in BC$

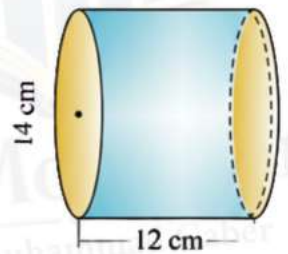
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- 16 Find the surface area and volume



($\pi \approx 3.14$)

.....

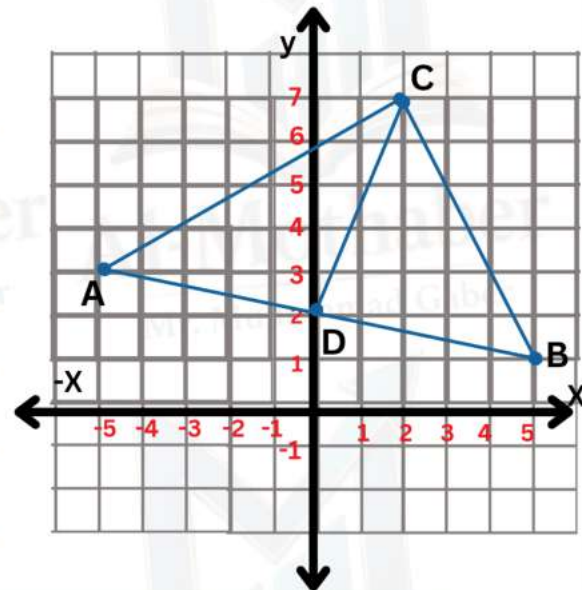
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- 17 In the given figure:
Prove that: $m(\angle ADC) > m(\angle BDC)$



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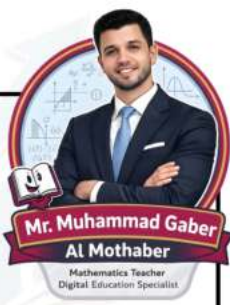
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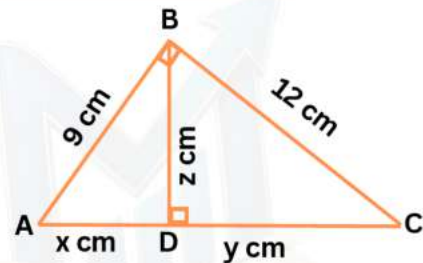


- 18 Find in terms of π the area and circumference of the circle whose center at C (2 , -1) and passing through the point A(-4 , 7)

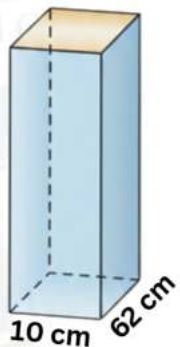
- 19 The points in the given table lie on one straight line. Find the slope of the straight line and the value of k

X	- 3	2	7	k
y	0	2	4	6

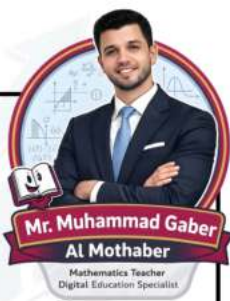
- 20 In the given figure: Find the values of X , y , z



- 21 In the given figure: The height of a right prism is 28cm, if the height increased by 0.7cm
What is the amount of increase in the surface area of the prism?



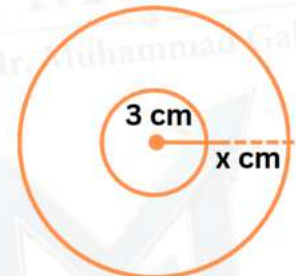
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- 22** A car factory produces 3 models of cars in the year. The number of cars produced of the first model is 500, from the second model 700, from the third model 300. If the factory management decided to take a 7% sample of the total production and each model is represented according to its production size, find the number of cars of each model in the sample.

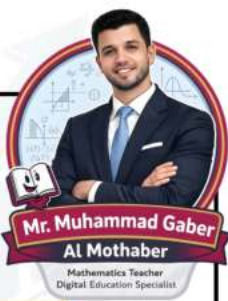
- 23** A random sample consisting of 50 students participated in a survey, there are 25 students prefer the Arabic, 20 students prefer Science, 15 students prefer both Arabic and Science. If a student was chosen randomly find the probability that the chosen student prefers at least one of the two subjects, and if the number of students in the school is 750, what is the expected number of students who prefer Science only?

- 24** In the given figure:
If the probability of hitting the colored region equals $\frac{1}{9}$, what is the value of X?

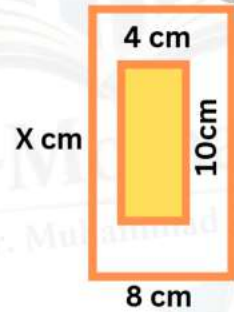




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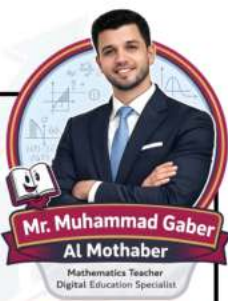
- 25** In a shooting competition, it was expected that if a shooter hits the board 56 times, the number of times he hits the colored region is 20. Find the value of X



- 26** On one day, the number of sold packages of preserved juices in one of the grocery chains was as shown in the given table: If the total number of packages sold during another day is 180 packages, what is the expected number of apple sales?

Type of juice	Mango	Apple	Guava
Number of packages sold	80	25	45





- 27** In an institutions specializing in providing advanced educational levels in English and French through its 4 branches, the applications for this service was during the first week of its opening were shown in the given table:

Branch Number Language	1	2	3	4
English	16	18	12	14
French	9	10	14	7

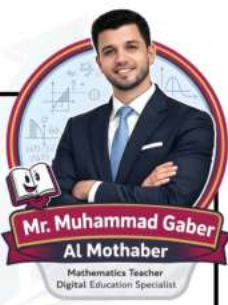
- a** Which of the two languages has more demand?
-
- b** If the institution can accommodate 1000 learners in all its branches, what is the expected number to be allocated for French language learners?
-

- 28** A random sample was taken consisting of 40 male and female players from the applicants for the handball and basketball tests at a club, their numbers were distributed as shown in the given table:

	Hand ball	Basket ball	Total
Player (male)	A	B	C
Player (female)	7	D	16
Total	25	E	F

- a** Find: $A + B + C + D + E + F$
-
- b** If the total number of applicants for the tests is 240, what is the expected number of female players applying for the basketball tests?
-





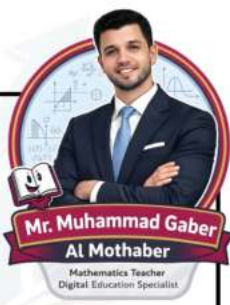
29 Find the positive number which if we add its square to each of the two terms of the ratio $5 : 11$, it becomes $3 : 5$

30 If a, b, c and d are in continued proportion, prove that :-

a $\frac{a^2 - 3c^2}{b^2 - 3d^2} = \frac{b}{d}$

31 If : $X = \{1, 2, 5\}$ and R is a relation on X where $x R y$ means " $x + 2y = \text{an odd number}$ " for each $x \in X$ and $y \in X$. Write R and represent it by an arrow diagram. Is R a function?





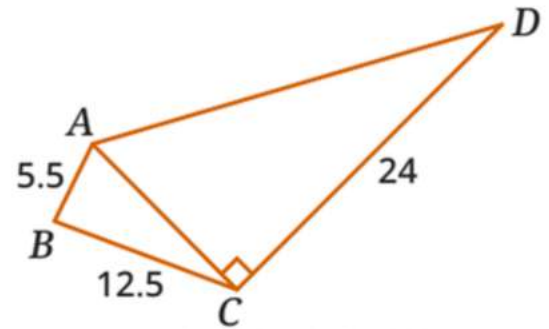
- 32** Find the solution set for each of the following inequalities in $\mathbb{R}$, then represent the solution on the number line :

a $6 - 3y \leq 2(y - 2)$

b $1 \leq 4 - 3(x - 1) < 13$

- 33** In the given figure:

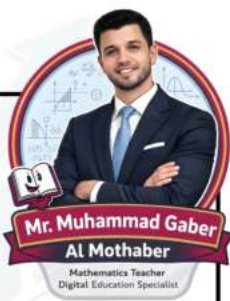
Find the set of possible values for the length of each of $\overline{AD}$, $\overline{AC}$



- 34** Arrange the measures of the angles of $\triangle ABC$ in each of the following cases ascendingly :

a If $AB = 12$ cm, $BC = 15$ cm, and $AC = 10$ cm.

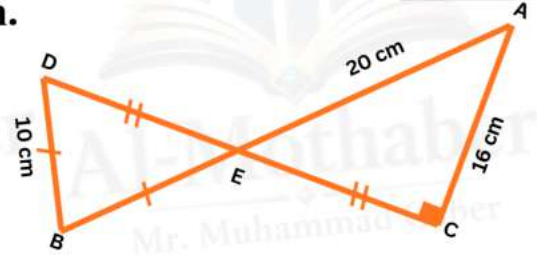




- 35** In the opposite figure: $\overline{AB} \cap \overline{CD} = \{E\}$,
E is the midpoint of $\overline{CD}$, $AC = 16$ cm, $AE = 20$ cm.
and $BD = BE = 10$ cm.

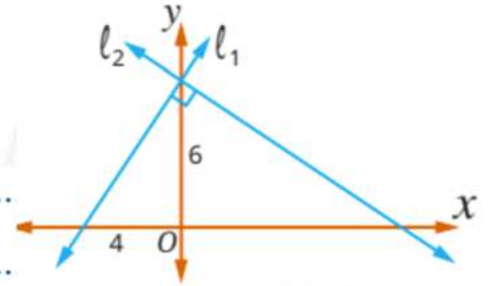
Find :

- a** The length of the projection of $\overline{BD}$ on $\overleftrightarrow{CD}$

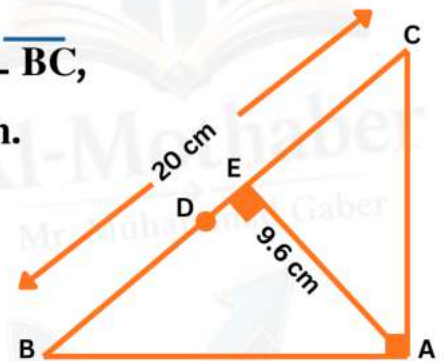


- b** The length of the projection of $\overline{AB}$ on $\overleftrightarrow{CD}$

- 36** In the following figure: Find the slope of
each of the two straight lines L_1 , L_2



- 37** In the opposite figure :
 $\triangle CAB$ is right-angled at A , $E \in \overline{BC}$ such that $\overline{AE} \perp \overline{BC}$,
D is the midpoint of $\overline{BC}$, $AE = 9.6$ cm. and $BC = 20$ cm.
Find : The length of each of $\overline{AB}$ and $\overline{AC}$



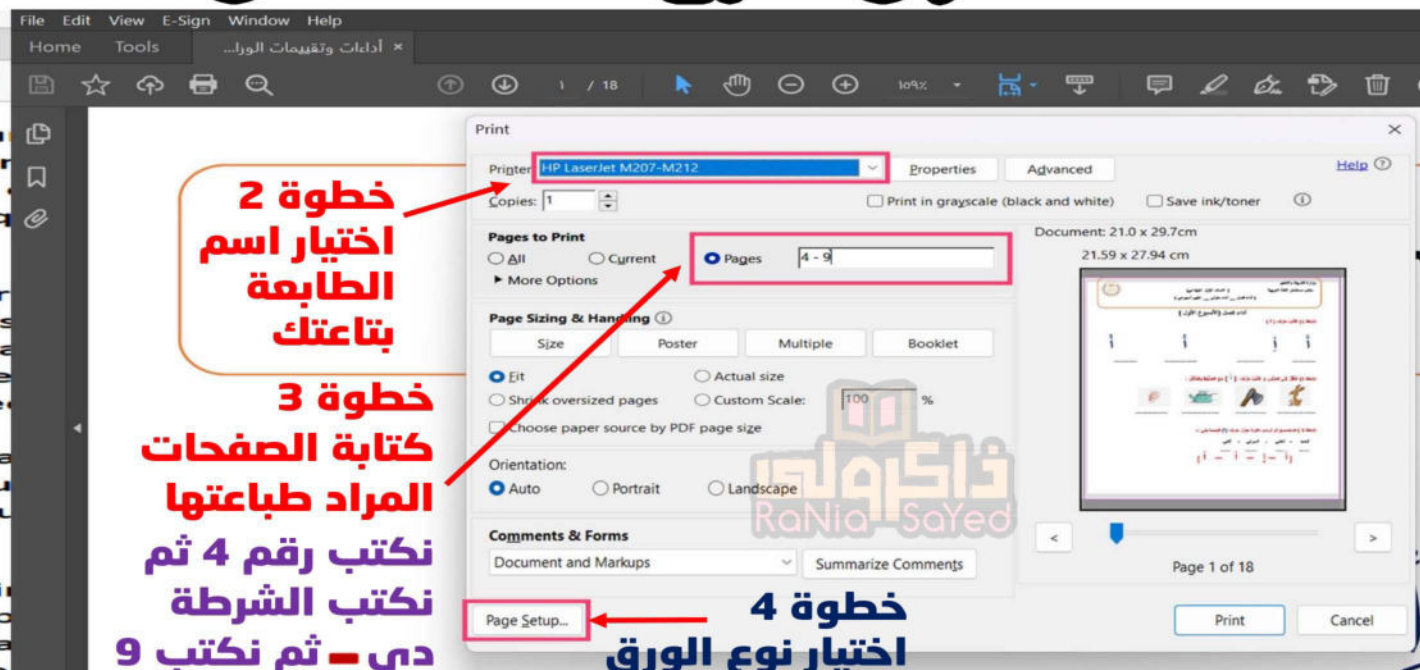
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كيفية طباعة صفحات معينة من ملف معين

مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



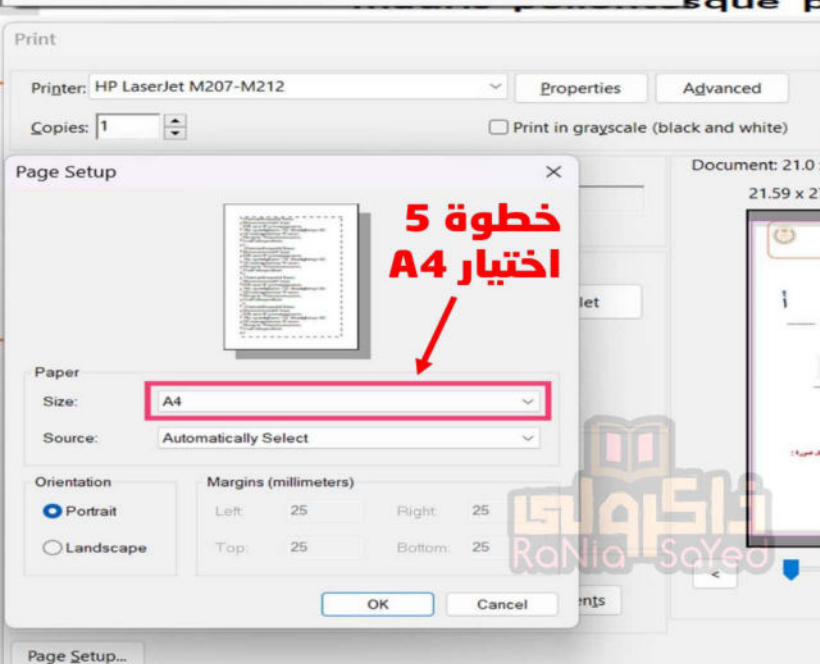
خطوة 1



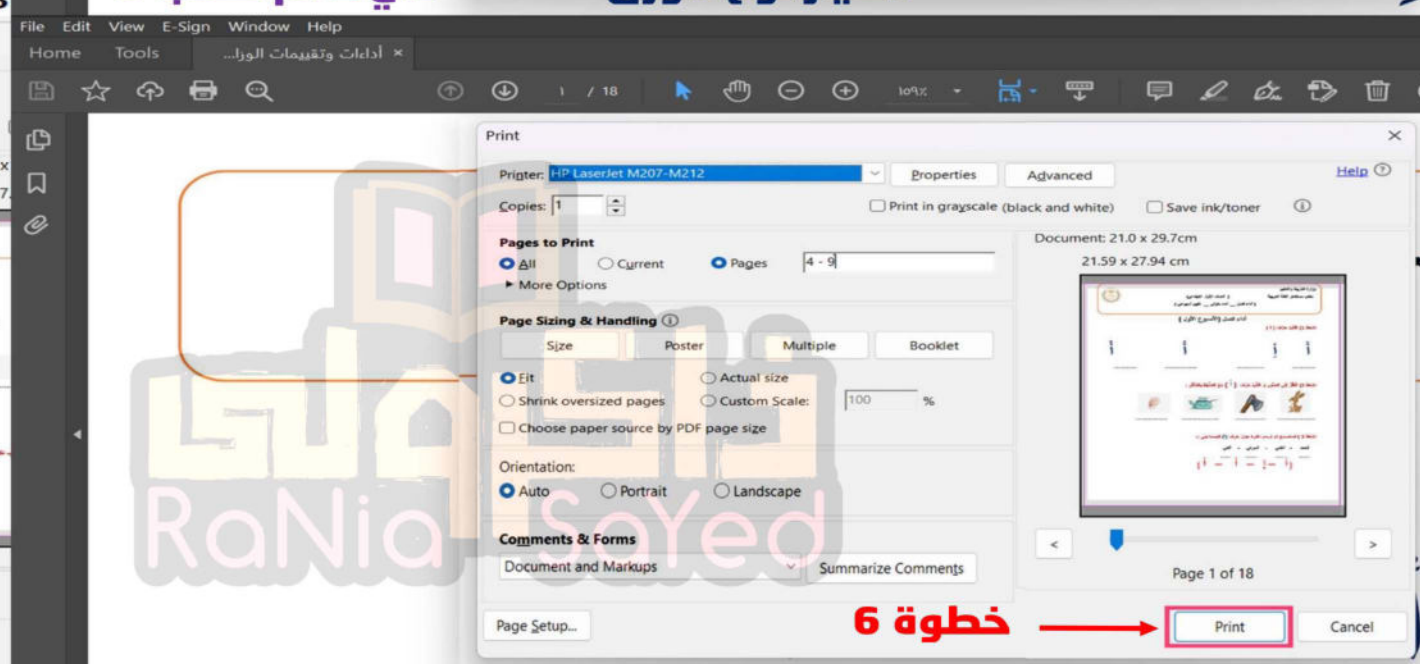
خطوة 2
اختيار اسم
الطابعة
بتاعتك

خطوة 3
كتابة الصفحات
المراد طباعتها
نكتب رقم 4 ثم
نكتب الشرطة
دي - ثم نكتب 9

خطوة 4
اختيار نوع الورق



خطوة 5
اختيار A4



خطوة 6